V/G.D.

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LONG IMMERSION INSTRUCTIONS FOR

105mm. HOWITZER MOTOR CARRIAGE M7

(WITH ADDITIONAL ARMOUR)

ON LOAN
RETURN TO T/S

This publication has been prepared to the instructions of
THE CHIEF INSPECTOR OF FIGHTING VEHICLES
to whom all communications should be addressed.

ON LOAN
RETURN TO T/S

COMPILED AND PUBLISHED BY
THE NUFFIELD ORGANIZATION

CHILWELL CATALOGUE No. 72/474

FIRST EDITION

TECHNICAL SERVICES
BRANCH

FOREWORD

The instructions enumerated in this book, carefully followed and worked to in every detail, ensure that the 105 mm. Howitzer Motor Carriage M7 can be successfully waded to a depth of 6 ft.

The various operations described are designed to be carried out by the vehicle crew.

It is absolutely essential that a vehicle intended for wading should be mechanically sound, otherwise the chances of carrying out a successful operation will be seriously impaired. It is therefore assumed in the following pages that the vehicle treated is in first-class order.

Even then certain extra maintenance is required, as described in "MAINTENANCE BEFORE SEALING." Before sealing is commenced certain modifications should have been made to the vehicle by R.E.M.E. workshops under D.M.E. Circular No. A1458.

Sealing instructions are divided into stages, commencing with "WORK CARRIED OUT IN THE FIELD." Each task therein must be completed in the sequence given. There is one chance to seal, only one, therefore follow the instructions implicitly and seal efficiently, and above all do not attempt any experiments.

PROPER SUPERVISION IS VITAL

An officer must be detailed to supervise sealing and be responsible for passing work as satisfactory.

An N.C.O. must be detailed to oversee the sealing of the Battery Commander's vehicle and so allow the Battery Commander to carry out the supervision.

Faults to look for are listed under "SEALING MATERIALS AND HOW TO USE THEM."

NOTE : One gallon of petrol per vehicle will be required for cleaning purposes ; an order to seal vehicles should automatically confer authority for the issue of the necessary quantity of petrol.

NOTE : Before commencing work, park the vehicle so that there is a 6 ft. working space on both sides of each vehicle and sufficient room fore and aft for removing the tracks.

FIRST EDITION

January, 1944

(I.F.V.)

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SEALING MATERIALS AND HOW TO USE THEM

VITALLY IMPORTANT

The officer responsible for passing work as satisfactory must at the outset inspect the sites where it is proposed to clean and seal vehicles. Vehicles must be parked on hard dry ground. Mud and water will spoil adhesion of the sealing compounds just as completely as will grease and oil.

CLEANLINESS is the first essential of successful sealing. Whenever cleaning and sealing work is to be done in wet weather, efficient covers must be arranged over vehicles.

CLEANING MATERIALS

Scraper or wire brush for removing caked mud, loose paint, etc., that water will not remove.

Clean rag or cotton waste for wiping down after washing, or with petrol or Bostik cleaner.

Petrol is used (sparingly) for preliminary cleaning of oily surfaces ; after using petrol finish off with Bostik cleaner.

Petrol must not be used on any of the Bostik compounds as it will destroy the sealing.

Bostik cleaner for final cleaning of surfaces before applying a sealing compound and for cleaning joints already sealed when a repair is necessary. Apply sparingly.

Do not use petrol or Bostik cleaner as a thinner for any of the sealing materials.

SEALING MATERIALS

BEFORE USING ANY OF THE SEALING MATERIALS, REMEMBER THE PREPARED SURFACE MUST BE DRY AS WELL AS CLEAN.

Bostik C. is an adhesive compound supplied in tins. It should be applied with a brush, and must fully cover the surface on which it is being painted. It is used as an adhesive for jointing fabric to metal or fabric to fabric. Bostik C. is painted on both the surfaces to be stuck together and must be allowed to get tacky before making the joint. The time required for drying is dependent on the weather conditions. **Replace the lid on the tin immediately after use.**

Bostik AA. is a sealing cement supplied in green tins for easy identification. It is normally applied with a brush to a surface prepared by cleaning with Bostik cleaner. Bostik AA. is used for sealing rivet or bolt heads, and close fitting seams, or on top of fabric, or W.D. Pressure Plastic (when painting it on fabric or Pressure Plastic omit the use of Bostik cleaner). **Replace the lid on the tin immediately after use.**

IMPORTANT. To apply Bostik C. or AA., brush it on with what can best be described as a "stippling" motion. Get plenty of the compound on the brush, and work it into the surface until there is a good covering of compound. **Bostik AA. must be worked right into seams. Do not just draw the brush straight along a seam, or merely dab on the compound.** Bostik C. and AA. must be made easily workable by stirring thoroughly before use. If stirring alone is not enough, warm the compound by standing the tin in hot water. **Do not get any water into the tin.**

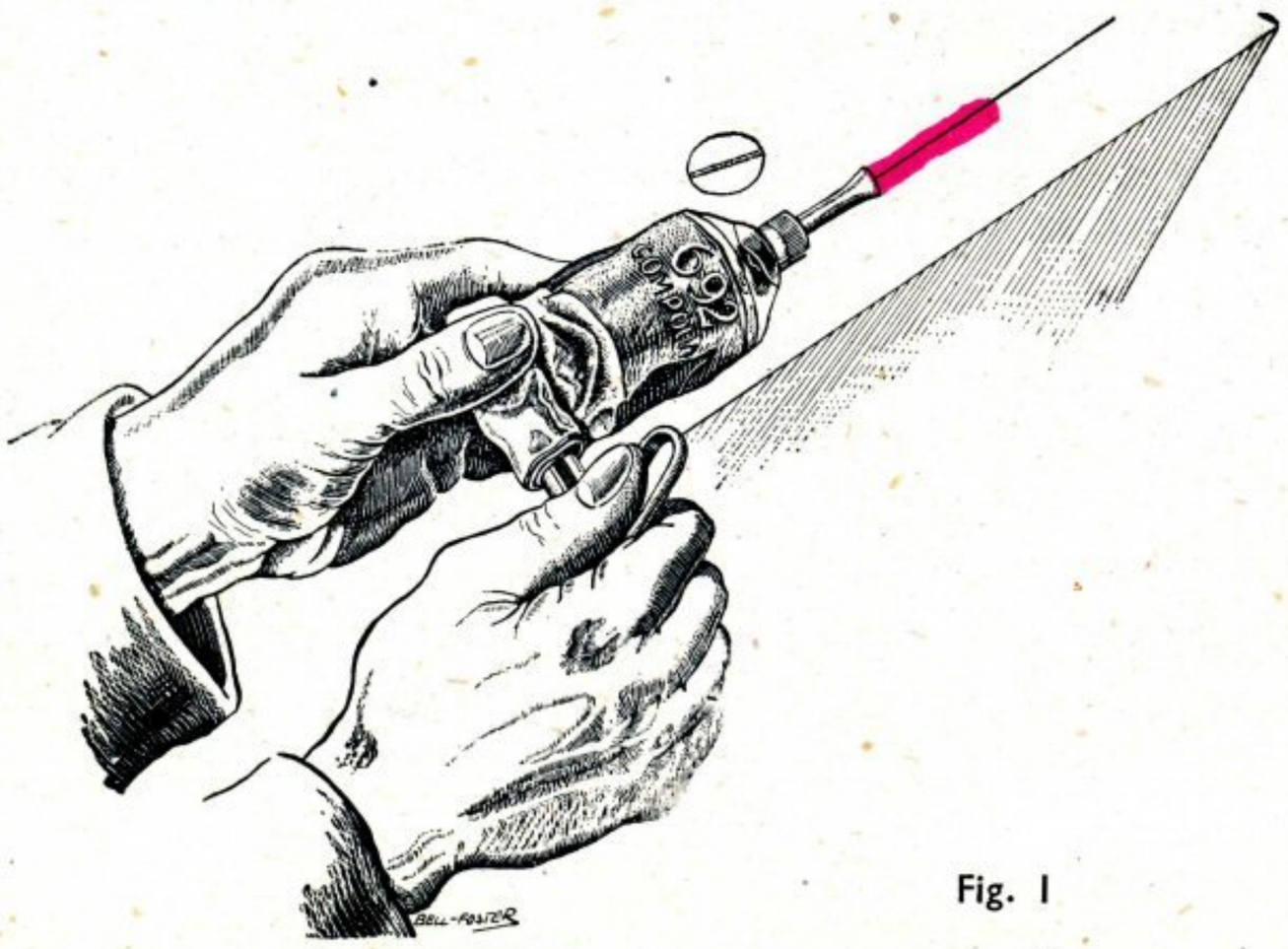

Fig. 1

Bostik 692 (see Fig. 1) is a sealing cement supplied in tubes, with detachable nozzles, and which are operated by winding a key at the bottom of the tube. Apply 692 by holding the nozzle to the seam

and turning the key. In cold weather warm the tube slightly to give an easy flow of compound, as if the cement is too stiff the tube will burst. **Replace the cap on tube after use, and always keep the detachable nozzle clean.** Wash it out with Bostik cleaner before putting it away.

Boscoprene 551 is a sealing compound which sets without coming into contact with air. When set it is not affected by oil or heat, and therefore is used especially for sealing in such places as the engine compartment. It is supplied in two parts : Part A in tins and Part B in bottles.

To use : Shake the bottle well, add the whole quantity to the Boscoprene 551 Part A and mix well by stirring. **Boscoprene must be used immediately after mixing. Even replacing the lid on the tin will not stop it from setting hard.**

W.D. PRESSURE PLASTIC

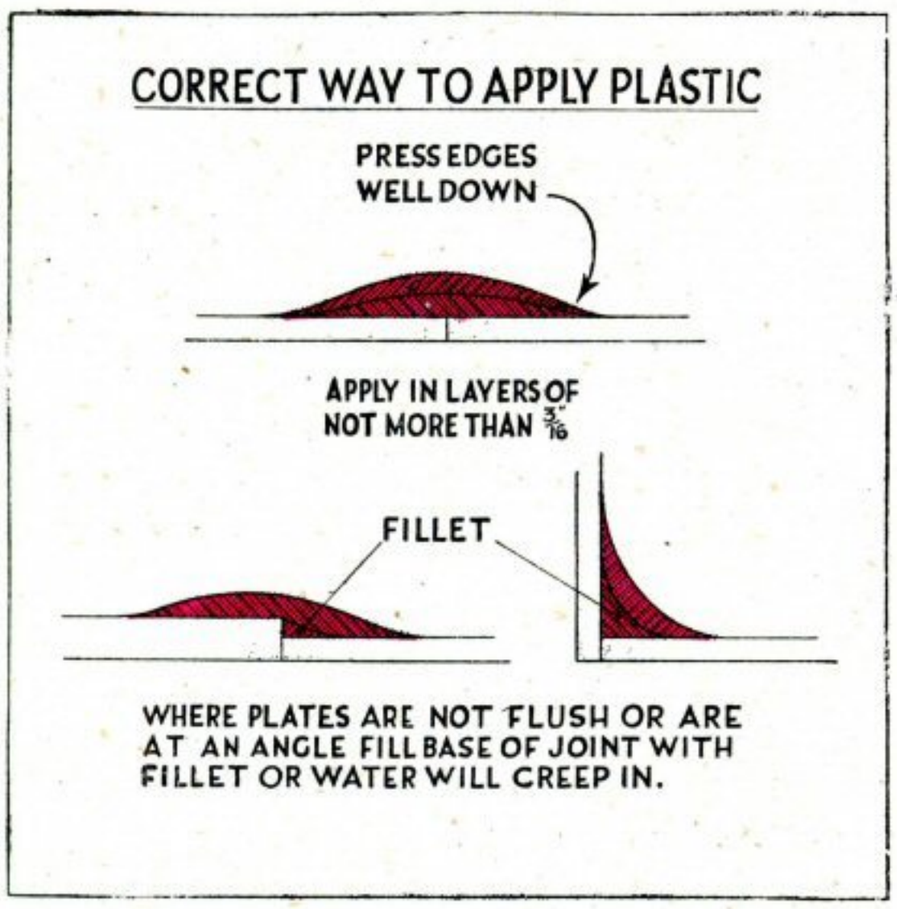
CORRECT WAY TO APPLY PLASTIC
PRESS EDGES WELL DOWN
APPLY IN LAYERS OF NOT MORE THAN 3/16"
FILLET
WHERE PLATES ARE NOT FLUSH OR ARE AT AN ANGLE FILL BASE OF JOINT WITH FILLET OR WATER WILL CREEP IN.

Fig. 2

W.D. Pressure Plastic (see Fig. 2) is a waterproof putty-like substance with which quite large holes can be filled. Where a large seal of plastic is required, it should be built up by putting on the plastic in layers, and worked out to a "feather" edge. Pressure Plastic is difficult to work, and must be made pliable by kneading.

If this does not make it workable enough it must be heated. The easiest way to do this is to cut up the plastic into workable sized lumps. Place one or two lumps in a tin, and put the tin into a bucket of hot water.

DO NOT WET THE PLASTIC.

SEALING FABRIC

Sealing Fabric is a waterproof fabric which must be handled with care and kept clean. It is supplied in pieces ready for fitting, but some trimming may be required. The fabric pieces will be stencilled to give the position in which they are to be fixed. Before fitting they must be examined for any holes or thin places. Repair by means of a fabric patch with Bostik C.

Fabric covers are attached to metal by means of Bostik C., which is applied to both surfaces and must be allowed to become tacky before making the joint.

Allow about one hour for the joint to set, then paint over the edges of the fabric and surrounding metal with Bostik AA. Avoid wrinkles at the edges of the fabric, and if a fold is necessary, make it at 45° to the edge.

Grease G.S. Used where ease of application and protection against corrosion are required. Apply by coating all parts specified.

A.C. (Asbestos Compound). A specially prepared sealing compound. Apply by coating it on the parts specified.

Two 1 in. brushes are supplied with the kits of sealing materials, check that they have bristles 1 in. long (i.e. the diameter of a halfpenny). If the bristles are longer, cut them off to this length. Cut bristles square.

One 2 in. brush is also supplied, check that the bristles are $1\frac{1}{4}$ in. long (i.e. the diameter of a penny). If the bristles are longer, cut them off square to this length.

INSPECT FOR

CLEANING before putting on the sealing compounds.

WASTE of materials through painting Bostik alongside of, instead of in the joints, leaving the lids off tins and failure to clean brushes.

EFFICIENCY of all sealing. Bostik must be applied in an unbroken film ; check that this is so in all awkward corners. Pressure Plastic and grease must present an unbroken surface, and the Pressure Plastic must be firmly pressed down at the edges. Fabric must be folded neatly, with no gaps in sticking down the edges.

SPECIAL KITS REQUIRED

KIT A. Hardware stores which tank crew will need for WORK CARRIED OUT IN THE FIELD and WORK CARRIED OUT PRIOR TO EMBARKATION. — 1 per vehicle. 2 per squadron as spares.

KIT C. Software stores which tank crew will need for WORK CARRIED OUT IN THE FIELD and for ACTION TAKEN ON LANDING CRAFT. — 1 per vehicle. 2 per squadron as spares.

KIT D. Software stores which tank crew will need for WORK CARRIED OUT PRIOR TO EMBARKATION and for ACTION TAKEN ON LANDING CRAFT. — 1 per vehicle. 2 per squadron as spares.

On the following pages all the items in Kits A, C and D are listed. This is done to enable the kits to be checked on receipt by units. In the event of a kit being found incomplete the fact should be brought to the notice of the War Office through the usual channels, as **Stores will not issue individual items.**

Vocab. Section	Chilwell Part Number	N.M. Ltd. Part Number	Description	No. off per Vehicle
			HARDWARE—KIT A	
LV1/USA	US321A	US321A	Corner pillars for splash plates (L.H.)	1
LV1/USA	US322A	US322A	Corner pillars for splash plates (R.H.)	1
LV1/USA	W1434	FB106/8D	Bolts for corner pillars to support angles ($\frac{3}{8}$ in. B.S.F. × 1 in. long)	6
LV1/USA	W16171	NMS126/4	Spring washers ($\frac{3}{8}$ in.)	6
LV1/USA	W9417	NMS1/3	Hexagon nuts ($\frac{3}{8}$ in. B.S.F.)	6
LV1/USA	US320A	US320A	Splash plate (rear)	1
LV1/USA	W1058	FB105/8D	Bolts for splash plate to corner pillars ($\frac{5}{16}$ in. B.S.F. × 1 in. long)	8
LV1/USA	W16016	NMS142/6	Plain washers	16
LV1/USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	8
LV1/USA	W9414	NMS77/4	Wing nuts ($\frac{5}{16}$ in. B.S.F.)	8
LV1/USA	US323A	US323A	Splash plate (L.H.)	1
LV1/USA	US324A	US324A	Splash plate (R.H.)	1
LV1/USA	W3058	FB105/8D	Bolts for splash plates to corner pillars ($\frac{5}{16}$ in. B.S.F. × 1 in. long)	4
LV1/USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	4
LV1/USA	W16016	NMS142/6	Plain washers	8
LV1/USA	W9414	NMS77/4	Wing nuts ($\frac{5}{16}$ in. B.S.F.)	4
LV1/USA	US158A	US158A	Bolts for splash plate support brackets	2
LV1/USA	W9415	NMS1/5	Hexagon nuts ($\frac{1}{2}$ in. B.S.F.)	2
LV1/USA	US325A	US325A	Clamp for splash plates	2
LV1/USA	W1058	FB105/8D	Bolts for clamps ($\frac{5}{16}$ in. B.S.F. × 1 in. long)	4
LV1/USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	4
LV1/USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	4

SPECIAL KITS REQUIRED

KIT		
A	Hardware stores which crews will need during Stages 1 and 2 of the sealing instructions.	1 per vehicle.
C	Software stores which crews will need during Stage 1 of the sealing instructions.	1 per vehicle.
D	Software stores which crews will need during Stages 2 and 3 of the sealing instructions.	

On the following pages all items in the kits are listed. This is done to enable the kits to be checked on receipt by units. In the event of a kit being found incomplete, the fact should be reported.

Further supplies of all materials listed can be obtained on application to the Commandant, Chilwell. Indents should be forwarded with a covering letter, for the attention of O. i/c P2A (Wading).

V.A.O.S. SECTION AND PART NO.	DESIGNATION	NO. OFF.
LV1/USA/W7203	KIT "A"	1
LV1/USA/US321A	Corner pillars for splash plates (LH)	1
LV1/USA/US322A	Corner pillars for splash plates (RH)	1
LV1/USA/W1434	Bolts for corner pillars to support angles 3/8" BSF x 1" long (MT5/FB.106/8D)	6
	~~(MT5/9724)~~	6
	WASHERS, SPRING, 3/8-in. S/1/3)(MT5/19623) ...	3
	.....	1
LV1/USA/W1058	Bolts hex. (5/16" BSF x 1" long)(MT5/FB.105/8D)	36
LV1/USA/W16016	Plain washers (NMS/142/6)	28
LV1/USA/V16099	Spring washers (5/16")(MT5/49948)	88
LV1/USA/W9414	Wing nuts (5/16" BSF)(MT5/30039)(NMS.77/4)	12
LV1/USA/US323A	Splash plate (LH)	1
LV1/USA/US324A	Splash plate (RH)	1
LV1/USA/US158A	Bolts for splash plates support brackets	2
LV1/USA/W9415	Hexagon nuts (1/2" BSF) (MT5/15844)	5
LV1/USA/US325A	Clamp for splash plates	2
LV1/USA/V9538	Hexagon nuts (5/16" BSF)(MT5/18336)	62
LV1/USA/US326A	Support for splash sheet	1
LV1/USA/W1062	Bolts for support to splash plates (5/16" BSF x 3/4" long) (MT5/FB.105/6D)	4
LV1/USA/US286A	Retaining strip (rear) for splash sheet	1
LV1/USA/US292A	Retaining strip (sides) for splash sheet	2

›cab. ction	Chilwell Part Number	N.M. Ltd. Part Number	Description	No. off per Vehicle
USA	US326A	US362A	Support for splash sheet	1
USA	W1062	FB105/6D	Bolts for support to splash plates ($\frac{5}{16}$ in. B.S.F. × $\frac{3}{4}$ in. long) ...	4
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	4
USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	4
USA	US286A	US286A	Retaining strip (rear) for splash sheet	1
USA	US292A	US292A	Retaining strip (sides) for splash sheet	2
USA	W1435	FB104/7D	Bolts for retaining strips ($\frac{1}{4}$ in. B.S.F. × $\frac{7}{8}$ in. long)	21
USA	W16172	NMS126/2	Spring washers ($\frac{1}{4}$ in.)	21
USA	V9541	NMS1/1	Hexagon nuts ($\frac{1}{4}$ in. B.S.F.)	21
USA	US167A	US167A	Splash plate (front)	1
USA	W1058	FB105/8D	Bolts for front splash plate ($\frac{5}{16}$ in. B.S.F. × 1 in. long)	2
USA	W16016	NMS142/6	Plain washers	4
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	2
USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	2
USA	US168A	US168A	Clamp for front splash plate	2
USA	W1434	FB106/8D	Bolts for clamps ($\frac{3}{8}$ in. B.S.F. × 1 in. long)	2
USA	US173A	US173A	Retaining strip (L.H.) for howitzer splash apron	1
USA	US174A	US174A	Retaining strip (bottom)	1
USA	US175A	US175A	Retaining strip (R.H. lower)	1
USA	US176A	US176A	Retaining strip (R.H. upper)	1
USA	US178A	US178A	Retaining strip	2
USA	W1435	FB104/7D	Bolts for retaining strips ($\frac{1}{4}$ in. B.S.F. × $\frac{7}{8}$ in. long)	36
USA	W16172	NMS126/2	Spring washers ($\frac{1}{4}$ in.)	36
USA	V9541	NMS1/1	Hexagon nuts ($\frac{1}{4}$ in. B.S.F.)	36
USA	US216A	US216A	Air outlet blanking plate	2
USA	US217A	US217A	Hook bolts	4
USA	W9418	NMS77/10	Wing nuts ($\frac{1}{4}$ in. B.S.F.)	4
USA	W16017	NMS29/3	Spring washers ($\frac{1}{4}$ in.)	4
USA	US151A	US151A	Filler piece for bottom rail	1
USA	W3058	FB105/8D	Bolts for filler piece ($\frac{5}{16}$ in. B.S.F. × 1 in. long)	2
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	2
USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	2
USA	US132B	US132B	Rear cover panel	1
USA	W1062	FB105/6D	Bolts for cover panel ($\frac{5}{16}$ in. B.S.F. × $\frac{3}{4}$ in. long)	26
USA	V16101	NMS5/3	Plain washers ($\frac{3}{8}$ in.)	26
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	26
USA	US131A	US131A	Rear cowl	1
USA	W1062	FB105/6D	Bolts for rear cowl ($\frac{5}{16}$ in. B.S.F. × $\frac{3}{4}$ in. long)	22
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	22
USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	22
USA	US110B	US110B	Lugs for tee bolts	3
USA	W1062	FB105/6D	Bolts for lugs ($\frac{5}{16}$ in. B.S.F. × $\frac{3}{4}$ in. long)	6
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	6
USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	6
USA	US264A	US264A	Air outlet duct	1
USA	W2926	TP18581	Eye brackets for outlet duct	3
USA	W1062	FB105/6D	Bolts for eye brackets ($\frac{5}{16}$ in. B.S.F. × $\frac{3}{4}$ in. long)	6
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	6
USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	6
USA	US111A	US111A	Tee bolts	3
USA	W9415	NMS1/5	Hexagon nuts ($\frac{1}{2}$ in. B.S.F.)	3
USA	W16103	NMS5/5	Plain washers ($\frac{1}{2}$ in.)	3
USA	US269A	US269A	Tie rod bracket for outlet duct	2
USA	W3058	FB105/8D	Bolts for tie rod brackets ($\frac{5}{16}$ in. B.S.F. × 1 long)	4
USA	V16099	NMS126/3	Spring washers ($\frac{5}{16}$ in.)	4
USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	4

V.A.O.S. SECTION AND PART NO.	DESIGNATION	NO. OFF
	KIT "A" - contd.	
LV1/USA/W1435	Bolts for retaining strips (1/4" BSF x 7/8" long) (MT5/FB/104/7D)	69
LV1/USA/W16172	Shakeproof washers (1/4") (MMS.126/2) (MT5/24861)	57
LV1/USA/V9541	Hexagon nuts (1/4" BSF) (MT5/15842)	69
LV1/USA/US167A	Splash plate (front)	1
LV1/USA/US168A	Clamp for front splash plate	2
LV1/USA/W1434	Bolts for clamps (3/8" BSF x 1" long) (MT5/FB106/8D) ..	2
LV1/USA/US173A	Retaining strip (LH) for howitzer splash apron	1
LV1/USA/US174A	Retaining strip (bottom)	1
LV1/USA/US175A	Retaining strip (RH lower)	1
LV1/USA/US176A	Retaining strip (RH upper)	1
LV1/USA/US178A	Retaining strip	2
LV1/USA/US216A	Air outlet blanking plate	2
LV1/USA/US217A	Hook bolts	4
LV1/USA/W9418	Wing nuts (1/4" BSF) (NMS 77/10)	4
LV1/USA/W16017	Washers Thackeray (1/4") (MT5/9649)	4
LV1/USA/US151A	Filler piece for bottom rail	1
LV1/USA/US132B	Rear cover panel	1
LV1/USA/W1062	Bolts for cover panel (5/16" BSF x 3/4" long) (MT5/FB105/6D)	26
LV1/USA/V16101	Plain washers (3/8") (MT5/9729)	32
LV1/USA/US131A	Rear cowl	1
LV1/USA/W1062	Bolts for rear cowl (5/16" BSF x 3/4" long) (MT5/FB105/6D)	22
LV1/USA/US110B	Lugs for Tee bolts	3
LV1/USA/W1062	Bolts for lugs (5/16" BSF x 3/4" long) (MT5/FB105/6D).	6
LV1/USA/US264A	Air outlet duct	1
LV1/USA/W2926	Eye brackets for outlet duct	3
LV1/USA/W1062	Bolts for eye brackets (5/16" BSF x 3/4" long) (MT5/FB105/6D) ..	6
LV1/USA/US1111A	Tee bolts	3
LV1/USA/V16103	Plain washers (1/2") (MT5/9731)	3
LV1/USA/US269A	Tie rod bracket for outlet duct	2
LV1/USA/US294A	Tie rods for outlet duct	2
LV1/USA/W9416	Wing nuts (MT5/25795)	2
LV1/USA/W17063	Blanking screw for engine inspection plate (NMS95/59).	1
LV1/USA/W16170	Plain washers (NMS142/25)	2
LV1/USA/W15146	Spring washers (MT5/9704)	1
LV1/USA/W5161	Hexagon nut (MT5/15939)	1

Vocab. Section	Chilwell Part Number	N.M. Ltd. Part Number	Description	No. off per Vehicle
LV1/USA	US294A	US294A	Tie rods for outlet duct	2
LV1/USA	W9416	NMS77/7	Wing nuts	2
LV1/USA	W9417	NMS1/3	Lock nuts ($\frac{3}{8}$ in. B.S.F.)	2
LV1/USA	W17063	NMS95/59	Blanking screw for engine inspection plate	1
LV1/USA	W16170	NMS142/25	Plain washers	2
LV1/USA	W15146	NMS126/1	Spring washer	1
LV1/USA	W5161	NMS78/10	Hexagon nut	1
LV1/USA	W3058	FB105/8D	Bolts ($\frac{5}{16}$ in. B.S.F. × 1 in. long)	12
LV1/USA	V9538	NMS1/2	Hexagon nuts ($\frac{5}{16}$ in. B.S.F.)	12
LV1/USA	V16101	NMS5/3	Plain washers ($\frac{3}{8}$ in.) ... } SPARES	6
LV1/USA	W1435	FB104/7D	Bolts ($\frac{1}{4}$ in. B.S.F. × $\frac{7}{8}$ in. long)	12
LV1/USA	V9541	NMS1/1	Hexagon nuts ($\frac{1}{4}$ in. B.S.F.)	12
			SOFTWARE—KIT C	
LV6/MT15	NIV605		$\frac{5}{16}$ in. dia. rope ... ... 12 ft. for howitzer splash apron. 15 ft. for fighting compartment splash sheet. 23 ft. for lashing hardware to vehicle.	50 ft.
LV6/MT15	NIV697	US169B	Canvas splash apron for howitzer	1
LV6/MT15	NIV698	US328A	Canvas splash sheet for fighting compartment	1
LV6/MT15	NIV699	ZA15439	Waterproof bag No. 5 for wireless set	1
LV6/MT15	NIV700	ZA20482	Waterproof bag No. 6 for wireless spares	1
LV6/MT15	NIV701	ZA15427	Waterproof bag No. 1 for microphones and variometer	6
LV6/MT15	NIV702	US329A	Fabric patch—control unit	1
LV6/MT15	NIV608	US335A	Fabric patch—fuel cock handles	2
LV6/MT15	NIV609	US336A	Fabric patch—transmission drain	1
LV6/MT15	NIV610	US337A	Fabric patch—locker sides	4
LV6/MT15	NIV611	US338A	Fabric patch—locker ends	4
LV6/MT15	NIV714	US201A	Wood plugging for dowels in final drive covers ($\frac{3}{8}$ in. dia. × 12 in. long)	1
LV6/MT15	NIV703	US200A	Wood bungs for tail lamp cables (2 pieces as supplied make 1 complete bung)	4
LV6/MT15	NIV211		Scraper	1
LV6/MT15	NIV207		Brushes—1 in. wide × 1 in. long bristles	2
LV6/MT15	NIV206		Brush—2 in. wide × 1$\frac{1}{4}$ in. long bristles	1
LV6/MT15	NIV208		Wire brush	1
LV6/MT15	NIV210		Putty knife	1
LV6/MT15	NIV606	US179A	Sealing strips for air outlet duct	2
LV6/MT15	NIV607	US180A	Sealing strips for air outlet duct	2
LV6/MT15	NIV193		Bostik cleaner—1 qt. tins	5 tins
LV6/MT15	NIV195		Boscoprene—Part A	3 tins
LV6/MT15	NIV196		Boscoprene—Part B	3 bottles
LV6/MT15	NIV191		Bostik AA.—1 qt. tins	12 tins
LV6/MT15	NIV192		Bostik C.—1 qt. tins	2 tins
LV6/MT15	NIV200		W.D. Pressure Plastic	21 lb.
LV6/MT15	NIV438		A.C.	56 lb.
LV6/MT15	NIV194		Bostik 692	4 tubes
LV6/MT15	NIV201		G.S. grease—7 lb. tins	2 tins
LV6/MT15	NIV704	US329A	Fabric patch—spare...	2
LV6/MT15	NIV604		Kit D	1
LV6/MT15	NIV241		Cotton waste } comprising Kit D	1 lb.
LV6/MT15	NIV438		A.C. ... } comprising Kit D	4 lb. ex Kit C

V.A.O.S. SECTION AND PART NO.	DESIGNATION	NO. OFF
LV6/MT15/NIV628	KIT "C"	1
LV6/MT15/NIV269	Line 1" ..... feet	50
	(12 feet for howitzer splash apron)	
	(15 feet for fighting compartment splash sheet)	
	(23 feet for lashing hardware to vehicles)	
LV6/MT15/NIV697	Canvas splash apron for howitzer (US169B)	1
LV6/MT15/NIV698	Canvas splash sheet for fighting compartment (US.328A)..	1
LV6/MT15/NIV699	Waterproof bag No.5 for wireless set (ZA.15439) ...	1
LV6/MT15/NIV700	Waterproof bag No.6 for wireless spares (ZA.20482).	1
LV6/MT15/NIV701	Waterproof bag No.1 for microphones and variometer (ZA.15427)	6
LV6/MT15/NIV702	Fabric patch control unit 20" x 20" (US329A)	1
~~LV6/MT15/NIV205~~	~~Insulating tape 1/2" (MT1/2249) ..... 2 oz rolls.~~	~~4~~
LV6/MT15/NIV608	Fabric patch fuel cock handles 7" x 7" (US335A) ...	2
LV6/MT15/NIV609	Fabric patch transmission drain 8" x 8" (US336A) ..	1
LV6/MT15/NIV610	Fabric patch locker sides 4" x 48"(US337A)	4
LV6/MT15/NIV611	Fabric patch locker ~~sides~~ ends 4" x 24" (US338A)	4
LV6/MT15/NIV714	Wood plugging for dowels in final drive covers 3/8 dia. x 12" long (US201A)	1
LV6/MT15/NIV703	Wood bungs for tail lamp cables (US200A)	4
LV6/MT15/NIV211	Scraper	1
LV6/MT15/NIV207	Brush paint 1".....	2
LV6/MT15/NIV206	Brush paint 2"	1
LV6/MT15/NIV208	Brush wire scaling	1
LV6/MT15/NIV210	Putty knife	1
LV6/MT15/NIV606	Sealing strips for air outlet duct (US179A)	2
LV6/MT15/NIV607	Sealing strips for air outlet duct (US180A)	2
LV6/MT15/NIV193	Bostik cleaner ..... quart tins	5
LV6/MT15/NIV195	Boscoprene "A" ..... ½ pint tins ...	3
LV6/MT15/NIV196	Boscoprene "B" ..... small bottles .	3
LV6/MT15/NIV191	Bostik "A.A" ..... quart tins	12
LV6/MT15/NIV192	Bostik "C" ..... quart tins	2
LV6/MT15/NIV200	W.D. Pressure plastic ..... 8 lb. containers	3
LV6/MT15/NIV438	Asbestos compound ..... 14 lb. tins ...	4
LV6/MT15/NIV194	Bostik 692 ..... tubes	4
LV6/MT15/NIV201	Grease G.S. ..... 7 lb. tins	2
LV6/MT15/NIV704	Fabric patch spare 20" x 20" (US329A)	2
LV6/CT/72/474	Instruction Book	1
LV6/MT15/NIV604	Kit "D"	1
LV6/MT15/NIV604	KIT "D"	1
LV6/MT15/NIV241	Cotton waste .....lbs....	1
LV6/MT15/NIV438	Asbestos compound ..(Ex. KIT 'C').... 2 lb. tins	2

MAINTENANCE BEFORE SEALING

1. All contents of stowage bins mounted at the rear of the vehicle must be checked and shortages reported ; all items of equipment must now be stowed correctly in the positions allocated. The lids must then be closed to ascertain whether they shut correctly, or are strained ; if they appear to be strained, contents must be re-packed until lids do close correctly. This is absolutely necessary to permit efficient sealing of all joints.

2. Internal and external inspection : Any screws, bolts or nuts found to be defective or missing must be replaced. **Pay particular attention to the points of attachment between the transmission casting and the hull, bogie brackets and idler brackets, final drive covers, top plating over engine compartment, the two extra joints in the three-piece transmission casting (where applicable), the rear engine door hinges and the door joint.**

3. Lubrication : The vehicle must be completely and thoroughly lubricated, paying particular attention to getting as much grease as possible into the road and tensioner wheel hubs. Grease up the towing loop shackle pins, using G.S. grease. In addition all vulnerable controls (levers, rods, etc.) are to be well coated with G.S. grease.

4. Clean all filters in the fuel system. Fill the oil and fuel tanks, in the latter case use an external filter. See that the flexible breather pipes are tucked in the filler apertures before the cast covers are closed. Re-fuelling must be done before sealing as petrol, or oil, if spilt, will destroy the efficiency of any sealing it may come in contact with.

5. Cleaning down externally : All mud and dirt, etc., adhering to the hull must be cleaned off, special attention being paid to the underside of the hull bottom plate, particularly inspection covers and drain plugs.

The correct procedure for cleaning is :—

Remove heavy incrustation of mud by scraping or brushing. Wash down the vehicle with a plentiful supply of water. An ordinary stirrup pump has been found efficient in doing this work, using the jet to remove obstinate particles of mud.

Dry off the water, either by wiping or by allowing the vehicle to stand for sufficient time.

It is imperative that all traces of oil or grease are removed. In this respect see that ALL trace of the greasy protective compound applied by the manufacturers to vehicles for transit by sea is removed. Clean off by using a rag soaked in petrol. **On no account must rag or cotton waste be dipped into the vehicle fuel tanks, petrol for cleaning purposes must be laid aside in a can. Never attempt to use paraffin or fuel oil for cleaning,** both fluids come under the category of **OIL**, which must be cleaned off.

Clean all parts to which sealing compound is to be applied by using Bostik Cleaner.

Remove and thoroughly clean all bolted-on inspection covers on the hull bottom plate. Take care that all bolts and nuts are retained in a safe place for further use. Any gaskets to be found on these covers are to be discarded.

Remove the towing hook from its bracket.

IMPORTANT : Take particular care not to mix bolts, screws, nuts, etc., having U.S. threads with those having British threads.

WORK TO BE CARRIED OUT IN THE FIELD OR IN CONCENTRATION AREA.

The illustrations used in this book show the various sealing materials by the use of the following colours :—

BOSTIK 692 AND AA. AND PRESSURE PLASTIC ...
BOSCOPRENE 551 ... ...
SEALING FABRIC ... ...
A.C. ... ...

FRONT OF VEHICLE (TRANSMISSION).

Before commencing Tasks 6 to 17 inclusive it must be emphasised that each side of the vehicle is to be dealt with separately and not simultaneously, i.e. after removing the track on one side of the vehicle at Task 6 the sealing work on that side of the vehicle must be completed up to Task 17 and that track replaced, the opposite side of the vehicle can then be attended to.

6. Remove the detachable front, rear and side portions of both track guards. During the actual wading operation these parts are liable to be damaged. Therefore do not refit, but arrange for stowage against future requirements.
In the case of late type vehicles having only front and rear track guards, without side guards, the front and rear portions are to be removed and subsequently refitted at Task 17.
Break both tracks and partially withdraw final drive sprockets ; these latter need not be removed completely, since partial withdrawal will provide sufficient working space for sealing final drives as called for at Task 9.
Remove also the two circular covers under fuel tank drains.

Two men are required for Tasks 7 to 11 inclusive.

7. **Joint " A " between transmission casting and slant plate. Fig. 3.**
Paint the joint and all the bolt heads with a generous coat of Bostik AA. On the left-hand side of the transmission casting there is a locker for " Grouser " stowage. The front end of this box meets the transmission casting, and the joint thus formed must be generously painted with Bostik AA. Inside the box will be found a metal plate, welded at an angle to the slant plate which forms the bottom of the box. The gaps at the ends of this plate and any found at its edges, are to be plugged with Pressure Plastic ; finally paint over with Bostik AA. Where the front slant plate meets the transmission casting there is a gap at each end, see " B," Fig. 3. These gaps **must be completely plugged** by ramming them with Pressure Plastic before finally painting over with Bostik AA.

8. **Joints " D " between the hull side plates and transmission casting. Fig. 5.**
The sealing treatment of these joints is similar on both sides of the vehicle. Paint the joints from top to bottom, and the bolt heads with a generous coat of Bostik AA. Where the joint continues from hull sides to bottom plate, the corners may require plugging with Pressure Plastic before applying the Bostik AA.

9. **Joints " C " between transmission casting and final drive covers. Fig. 3.**
Having made sure that the immediate area **all** round both joints is free from dirt and grease and that all the bolt heads are clean, paint the joints with a generous coat of Bostik AA. All the bolt heads are then to be coated with the same compound, making sure in its application that **all** sides of each bolt head are well covered. In this respect it may be necessary to use the fingers, rather than a brush, so as to ensure effective sealing. In addition to bolts the final drive covers are fitted with dowels. In some cases these are solid, in others they are hollow. The treatment for solid dowels is the same as for bolt heads. Hollow dowels are first plugged with a suitable length of wooden rod cut off from the length supplied in the kit. The end of this rod should project for about $\frac{1}{2}$ in. when fitted. The dowels and their plugs are then sealed with Bostik AA.

10. **Two drain plugs " K," Fig. 8, and two plugs " D," Fig. 3, in the transmission casting.**
Do not remove these plugs, but see that they are tight. Paint over with Bostik AA.

See that ALL trace of the greasy protective compound, applied to the vehicle by the manufacturers, is removed as called for at Task 5.

APPLICATION OF SELF-SEALING MATERIAL TO INLET AND EXHAUST DUCTS.

MATERIALS

The self-sealing materials and equipment required for their application are packed as follows:-

(a)	Inner and Outer fabric	Packed as a kit marked to show vehicle for which suitable.
(b)	Self-Sealing Sandwich	
(c)	Fixing Instructions	
(d)	Two 2-in. Brushes	
(e)	One Knife	
(f)	One tin of Priming Paint	issued separately.
(g)	One tin of Neoprene Cement	

I N T R O D U C T I O N

The process consists of sticking three layers of material to the duct in the following order :-

(i) A layer of waterproofed fabric

(ii) A special sealing sandwich

(iii) A second layer of waterproofed fabric

The materials are provided cut to size and marked so that it is only necessary to prepare the duct with a priming paint and coat the layers with adhesive and stick them in position.

The layers are stuck to the duct on the bottom half; a margin of about 3 in. being allowed below the edge of the layers and the bottom of the duct, so that the final coating of waterproof fabric may be stuck to the metal.

NOTE: The process employs cements which are designed to be used similarly to those employed in repairing punctures in cycle tyres. You must, therefore, be certain, when placing any of the materials in position, that they are in the correct position. If it is necessary to rip them off and start again the efficiency of the sealing system may be impaired and the materials themselves may be damaged.

The job is carried out in stages as follows:-

A. PREPARATION OF THE DUCT.

(i) Clean off all loose paint, scale or rust with dry emery cloth or similar abrasive; do not use oily rags.

(ii) Apply one coat of priming paint (grey paint).

(iii) Allow this paint to dry before proceeding to Stage B. (This may take as long as one hour if drying conditions are bad).

B. APPLICATION OF THE LAYER OF FABRIC.

(i) Apply one coat of the grey/brown cement to the duct and allow it to dry.

(ii) Apply a small amount of the cement to the black side of the fabric with a brush.

(iii) Apply a second coat of cement to the duct and when this coat is dry wrap the fabric firmly around the duct with the tacky faces together, being careful to remove all air trapped between it and the metal

(iv) Trim off any excess fabric at the end, after allowing 1½ to 2 in. overlap.

C. APPLICATION OF THE SEALING SANDWICH.

(i) Coat the fabric on the duct with one coat of the grey/brown solution and apply a similar coat to the black side of the sealing sandwich. Allow these coats to dry until they are not wet to the finger.

(ii) Apply a second coat of the cement to the fabric and to the sandwich, and again allow to dry.

(iii) Press the sandwich into position, rubbing firmly to remove all air trapped between it and the fabric.

(iv) Trim off any excess sandwich where the end and side panels overlap.

D. APPLICATION OF THE WATERPROOF FABRIC

NOTE: This fabric is cut to allow an overlap of 1½ to 2 in. where the portions covering the sides and ends of the duct overlap. A similar amount of overlap is allowed on the edges so that the fabric may be stuck down to the metal of the duct.

Sufficient fabric is provided to wrap twice around the duct: therefore, divide the material into two halves and proceed as follows:-

(i) Apply two coats of the grey/brown cement to the sandwich and to the duct for 2 in. above and below the sandwich. Apply two similar coats to the black side of the waterproof fabric. Allow these coats to dry as described under C above.

(ii) Wrap the fabric around the duct, rubbing firmly to remove all air trapped between it and the sandwich.

(iii) Press the overlap of the fabric on to the metal of the duct, making certain that it adheres firmly and that the edges are sealed.

(iv) Apply two coats of cement to the first layer of fabric and to the black side of the second piece of waterproofed material. Allow these coats to dry as described under C above.

(v) Wrap the fabric firmly around the duct, rubbing to remove all air trapped between it and the first layer of waterproofed material, and pressing the overlap of the fabric over the edges, making certain that the whole assembly is sealed so that water cannot penetrate to the sealing sandwich when the system is immersed.

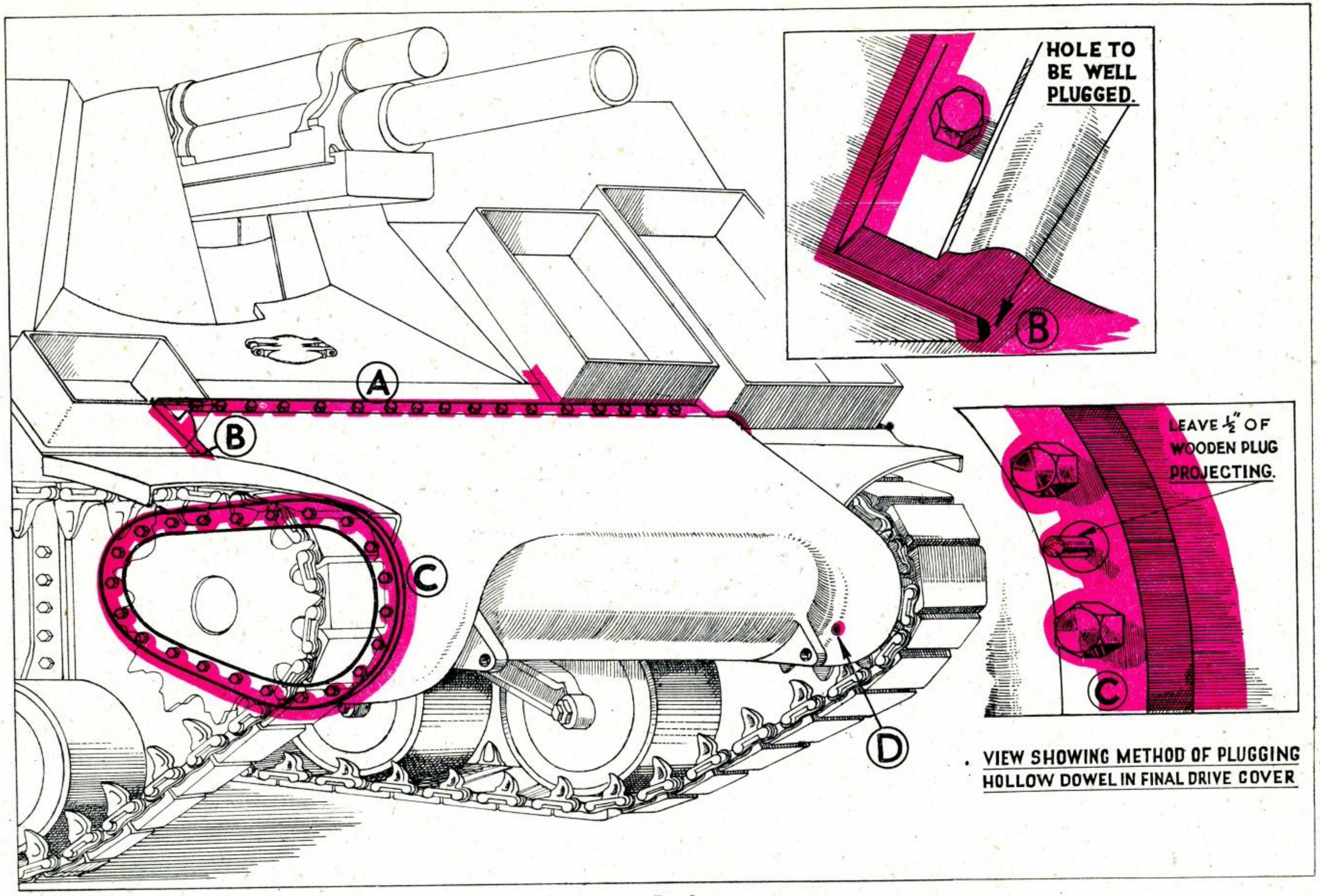
HOLE TO BE WELL PLUGGED.
B
A
B
C
D
LEAVE ½" OF WOODEN PLUG PROJECTING.
C
VIEW SHOWING METHOD OF PLUGGING HOLLOW DOWEL IN FINAL DRIVE COVER

Fig. 3

11. **Three-piece transmission casting (where applicable). Fig. 4.**
Certain vehicles may be found fitted with this type of transmission casting. The sealing of this type is similar to the one-piece casting, already described, with the addition of two extra joints in the three-piece casting which must be sealed as follows :—
Make sure that the area around each joint is clean, together with the nuts and bolt heads. Seal the joints with a generous coat of Bostik AA. Seal also with the same compound the nuts and bolt heads. In this case be certain to cover all sides of the nuts and bolt heads.

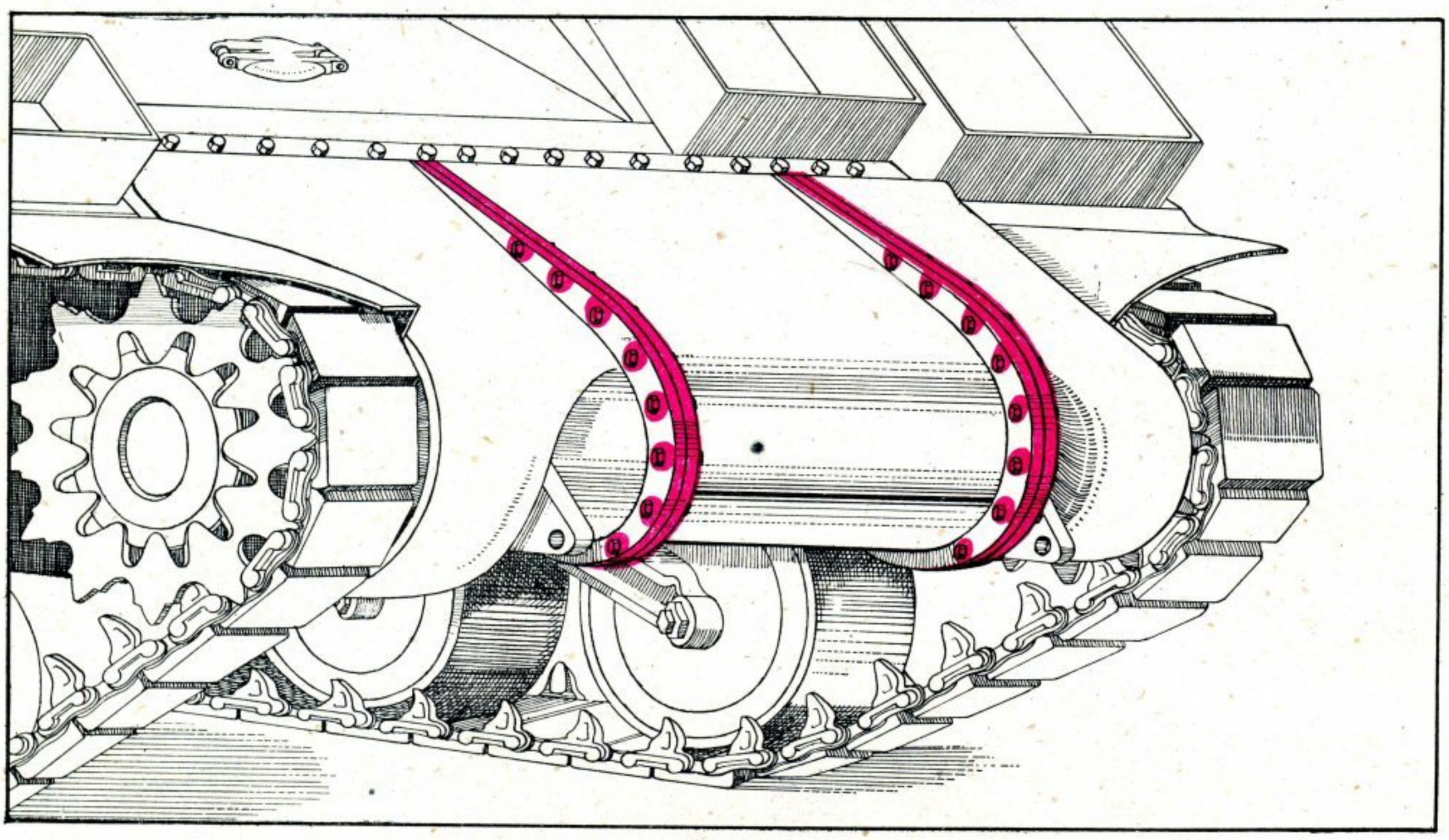

Fig. 4

12. **On completion of all work specified in Tasks 7 to 11 inclusive, carefully inspect, paying particular attention to work called for in Tasks 7, 8 and 9 : this is of great importance.**

RIGHT AND LEFT HULL SIDE PLATES.

13. **Six bogie brackets " A," Fig. 5.**
There are three bogie brackets on each side of the vehicle. Where each fits the hull side plates, paint the joint and the fixing bolt heads with Bostik AA. Note : Should any crevices be discovered, first fill these with Bostik 692. When carrying out the work in this task, take care that the sealing is carried well down to the corners formed by the hull sides and the hull bottom, so as to ensure that it will join up with the sealing specified later at Task 31. At these corners, see " T," Fig. 8, it will be necessary to first plug the gaps with Pressure Plastic before applying Bostik AA.

14. **Two idler brackets " B," Fig. 5.**
In this task deal only with the portions of the idler brackets that are bolted or riveted to the hull side plates. At the points where the idler brackets fit round the corners formed by the hull side and rear plates, gaps, see " A," Fig. 7, will be found at the top and bottom of the brackets. These must first be plugged with Pressure Plastic. Paint the joints between the idler brackets and the hull side plates, including the gaps already fitted with Pressure Plastic, with Bostik AA. The fixing rivets or bolts are also to be painted with Bostik AA.

15. **Side support angles " C," Fig. 5.**
Paint with a liberal coat of Bostik AA. the entire length of joint between the vertical portion of the supporting angles and the hull side plates, together with the joint formed between the horizontal portion of the hull and the support angles. Paint also, with the same compound, the joints at both ends of the supporting angles, and all the rivet heads. Should any gaps be found along these joints, they should first be plugged with Bostik 692 or Pressure Plastic as may be found necessary.

See that ALL trace of the greasy protective compound, applied to the vehicle by the manufacturers, is removed as called for at Task 5.

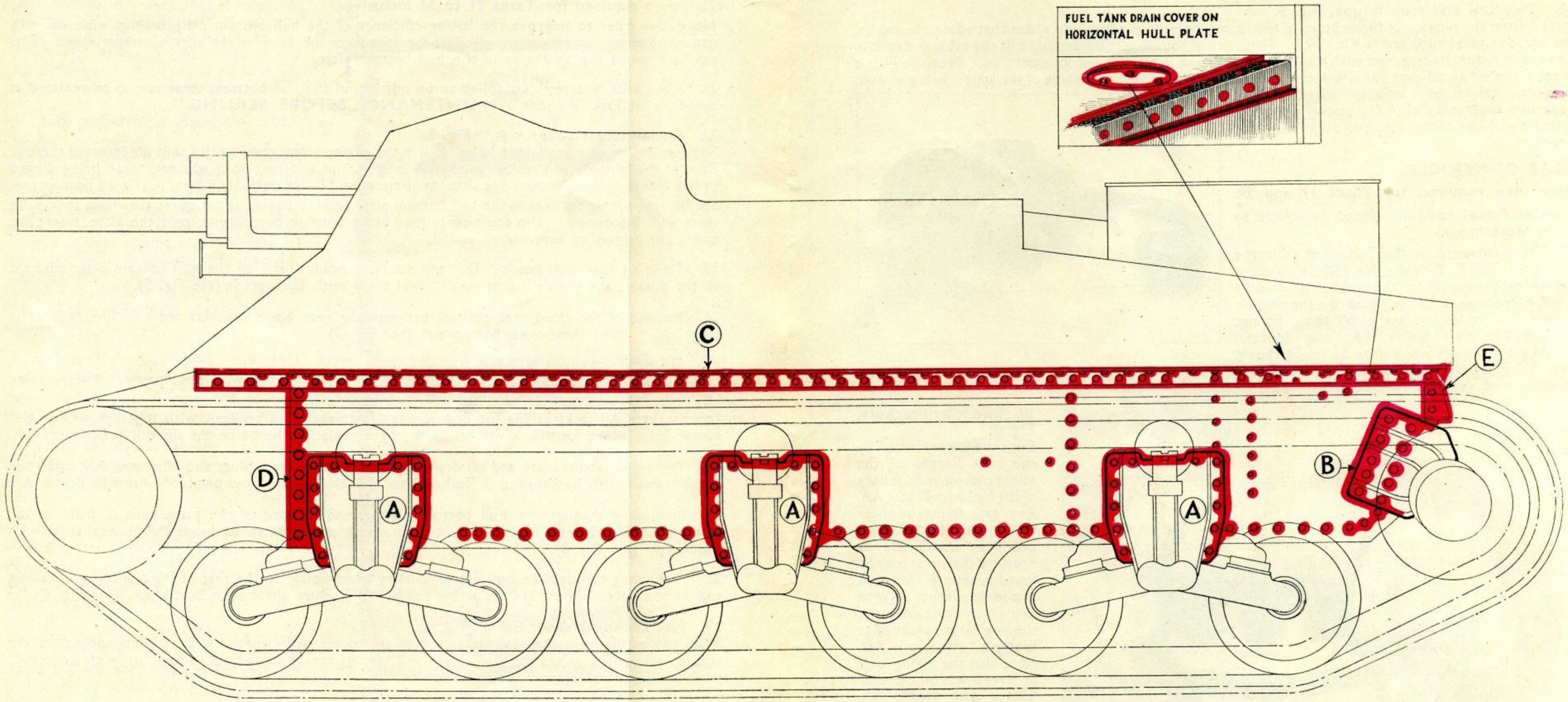

Fig. 5

16. Seal all rivet heads and bolt heads to be found on the hull side and horizontal plates with Bostik AA. Just above the idler bracket, on both sides of the vehicle, there is a small plate, "E," Fig. 5. Seal the edges and the two bolt heads with Bostik AA.

17. The two drain covers already removed at Task 6 are now refitted. The mating surfaces are coated with Bostik AA. and the fixing screws dipped in the same compound and then refitted. The tracks are now to be refitted and adjusted in accordance with the instructions given in the vehicle hand book. If late type vehicle (see Task 6), refit front and rear track guards.

18. **Two tail and stop lamps, Fig. 6.**
Insert, from the outside of the vehicle, in the square holes in the hull side plates that admit the cables, the wooden plugs supplied in Kit "A." These are of square section, bored to fit the cable and split in halves and should be trimmed with a knife to a taper and lightly tapped into position. Pressure Plastic is then applied to all gaps and crevices round the plugs. Cover the whole of the lamps, fixing screws, brackets, cables and wooden plugs, with a generous application of A.C., paying particular attention to the cables, wooden plugs and lamp brackets.

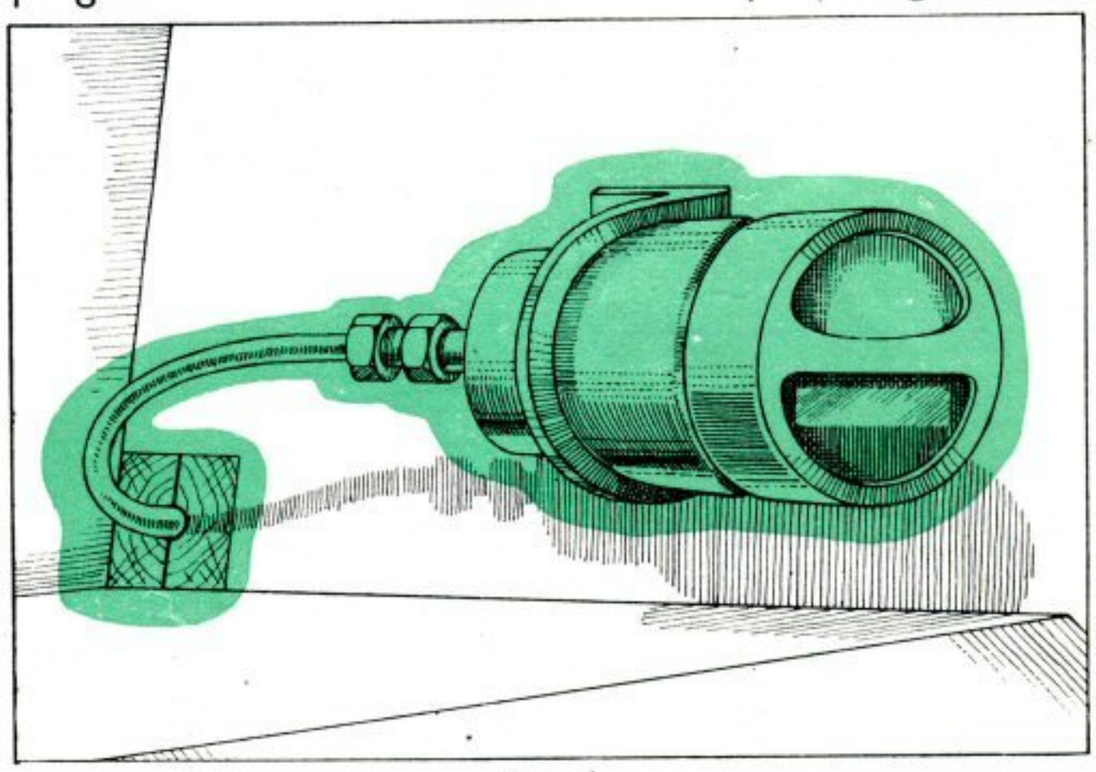

Fig. 6

REAR OF VEHICLE.

Two men required for Tasks 19 and 20.

Special metal sections (fitted to vehicle by Army workshops).

19. As mentioned in the Foreword (referred to under D.M.E. Circular No. A1458) various fittings are welded to the vehicle to enable wading equipment to be fitted by the vehicle crew. The welded joints of all these fittings are painted with Bostik AA., any doubtful welding or crevices which may be found should first be plugged with Bostik 692 or Pressure Plastic, as may be found necessary. **Similarly, inspect and seal all welded seams on the outside of the vehicle.**

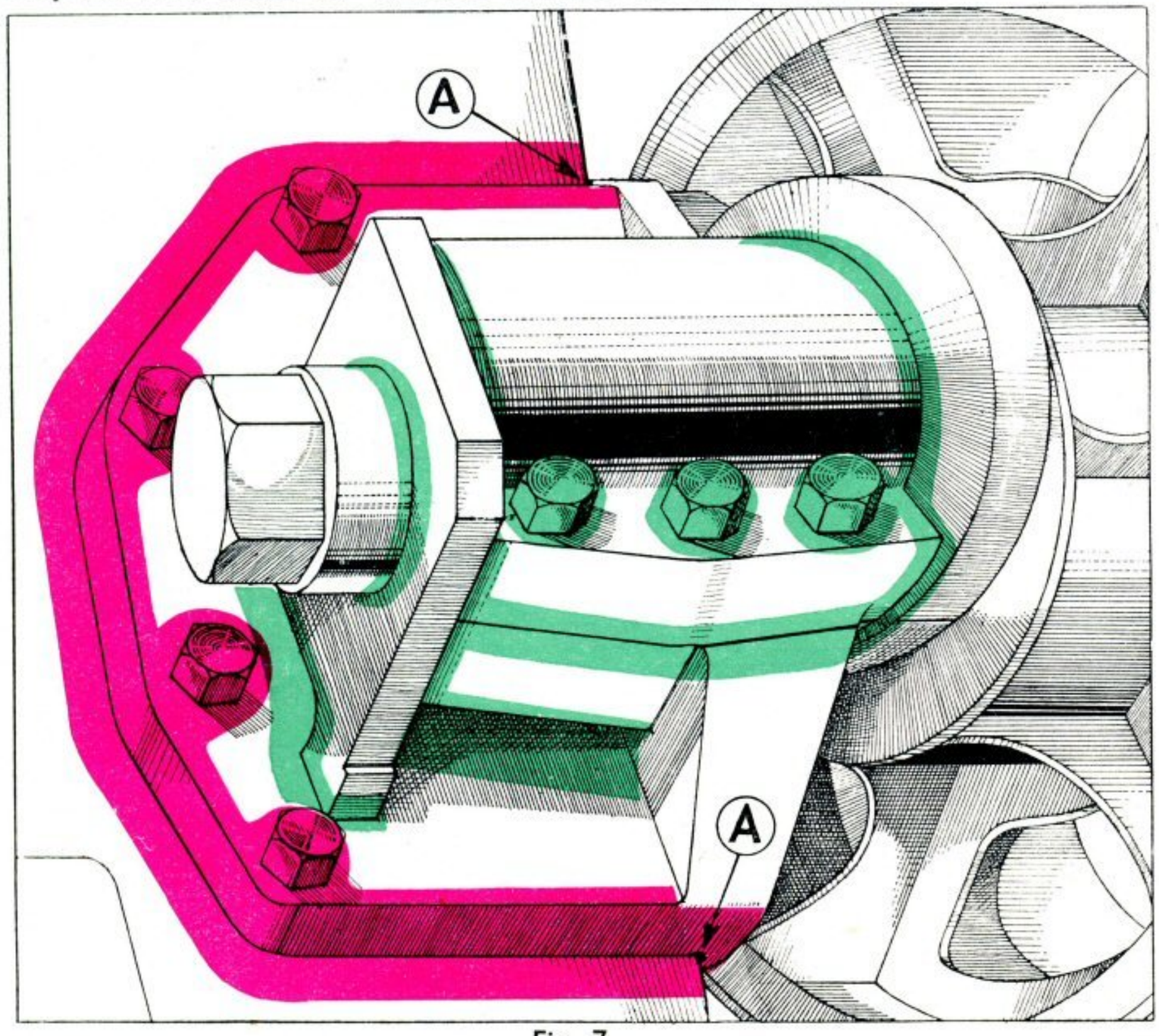

Fig. 7

20. **Two idler brackets, Fig. 7.**
Paint the joints formed by the back flanges of the idler brackets and the back of the hull with Bostik AA. Any gaps found in these joints should be first plugged with Bostik 692 or Pressure Plastic as may be found necessary. See that this sealing meets up with that already carried out at the side flanges of the idler brackets (see Task 14). Paint also the fixing bolt or rivet heads on the rear flanges with Bostik AA. Note in sealing the rear flanges of the idler brackets, the top edges come close to the horizontal metal sections welded to the rear of the hull. Make sure, therefore, that at these particular points the sealing is thoroughly carried out. Next apply

See that ALL trace of the greasy protective compound, applied to the vehicle by the manufacturers, is removed as called for at Task 5.

A.C. all round the two track adjuster locking plates on both sides of each plate. Fill the split along the bottom of both adjuster shank casings with A.C. and also cover, with the same compound, both spreader bolt heads and so much of the threaded portions as protrudes from the split casings. Seal also the four clamping bolt heads with A.C. Finally seal the joints formed by the split casings and the outer flanges of the adjusters with A.C., taking care to effect a seal **all** round the joints.

HULL BOTTOM PLATES.

Two men required for Tasks 21 to 34 inclusive.

Note :—In order to improve the lasting efficiency of the hull bottom plate sealing, wipe up, with cotton waste, any accumulation of oil to be found on the floor of the engine compartment. This can be done via the apertures in the hull bottom plate.

21. If any bolts or screws are found to be missing on the hull bottom, these are to be replaced as called for at Task 2 under **"MAINTENANCE BEFORE SEALING."**

22. **Engine access cover " A," Fig. 8.**
There will be found a small drain hole " C " in the engine access cover with a split pin inserted therein. Remove the split pin and replace with a $\frac{3}{16}$ in. bolt, nut and two plain washers, these being dipped in Boscoprene before fitting. See that the drain plug " B " is tight, then paint over with Boscoprene. See that the mating surfaces of the hull bottom plate and the engine access cover are clean, then paint them with Boscoprene. Dip the twenty-four fixing bolts in Boscoprene, refit the plate, insert the bolts, and tighten up securely all round.

23. There are four bolt heads " D " and six rivet heads " E " on the hull bottom plate adjacent to the sides of the engine access cover. Seal these with Boscoprene (see Fig. 8).

24. Forward of the transverse channel between the rear bogie brackets are two fuel tank drain plugs " F." Paint these with Boscoprene (see Fig. 8).

25. **Oil drain cover " N," Fig. 8.**
Paint the mating surfaces of the cover and the hull bottom plate with Boscoprene. After dipping the four countersunk screws in Boscoprene, refit the cover.

Important : All tasks calling for Boscoprene treatment must be dealt with together. Once this compound is mixed for use, it will set hard. Even replacing the lid on the tin will not prevent this.

26. The engine access plate and oil drain cover edges, the drain plugs and all screw, bolt and rivet heads treated with Boscoprene in Tasks 22 to 25 inclusive, are now painted over with Bostik AA.

27. Protruding through the hull bottom plating, and forward of the plate joint in front of the transverse channel, between the rear bogie brackets, are three screw heads " R." Seal these with Bostik AA. (see Fig. 8).

28. Protruding through the hull bottom plating immediately to the rear of the transmission casting and on the driver's side, are six screw heads " S." Paint these with Bostik AA. (see Fig. 8).

29. **Five dump valves " G," Fig. 8.**
With the valves open the seatings and faces are to be well cleaned, A.C. is then applied to the seating faces. The valves are then closed and surplus grease forced out is built up with more A.C. until the dump valves are completely sealed.

30. **Gearbox drain plug " H," Fig. 8.**
See that the plug is tight. The aperture around the drain plug is packed with Pressure Plastic flush with the hull bottom plate and sealed off with a fabric patch, this being large enough to include the four rivet heads around the aperture. Finally paint over the patch with Bostik AA.

31. **The joint " J " between the transmission casting and the front edge of the hull bottom plate, Fig. 8.**
If any crevices are found in this joint they are to be filled with Bostik 692. Paint the joint throughout, together with all the fixing bolt heads, with Bostik AA.

See that ALL trace of the greasy protective compound, applied to the vehicle by the manufacturers, is removed as called for at Task 5.

32. **Six bogie brackets " L," Fig. 8.**

Where each of the bogie brackets fits the hull bottom plate, all large gaps are to be filled with Pressure Plastic, and small crevices to be filled with Bostik 692. Finally paint over with Bostik AA. This sealing is to be carried up the hull side plates enough to ensure that it meets up with the sealing of the vertical portions of the bogie brackets already carried out in Task 13. All fixing bolt heads on the bottom flanges " L " of the bogie brackets are to be painted over with Bostik AA.

33. **Two transverse channels " M," Fig. 8.**

Plug the open ends " V " of both channels with Pressure Plastic. Paint over the Pressure Plastic and the ends of the channels with Bostik AA. Paint the joints between the channel flanges and the hull bottom plating together with all rivet and bolt heads with Bostik AA. This sealing is most important. The Pressure Plastic used to plug the ends of the channels must form a generous and efficient seal.

34. **Joints " P " between hull side plates and hull bottom plates, Fig. 8.**

Paint the two joints from end to end, that is from the transmission casting to the bottom of the idler brackets at the rear of the vehicle, with Bostik AA. Paint also, with the same compound, the two rows of rivet heads that run parallel to the joints.

35. **Three transverse joints " Q " in hull bottom plates, Fig. 8.**

Paint these joints and the rows of rivet and bolt heads adjacent and parallel to them with Bostik AA.

36. Any bolt or screw heads or rivets on the hull bottom not already mentioned specifically are now to be sealed with an application of Bostik AA.

37. **On completion of all work specified in Tasks 22 to 36 inclusive carefully inspect. This is of great importance.**

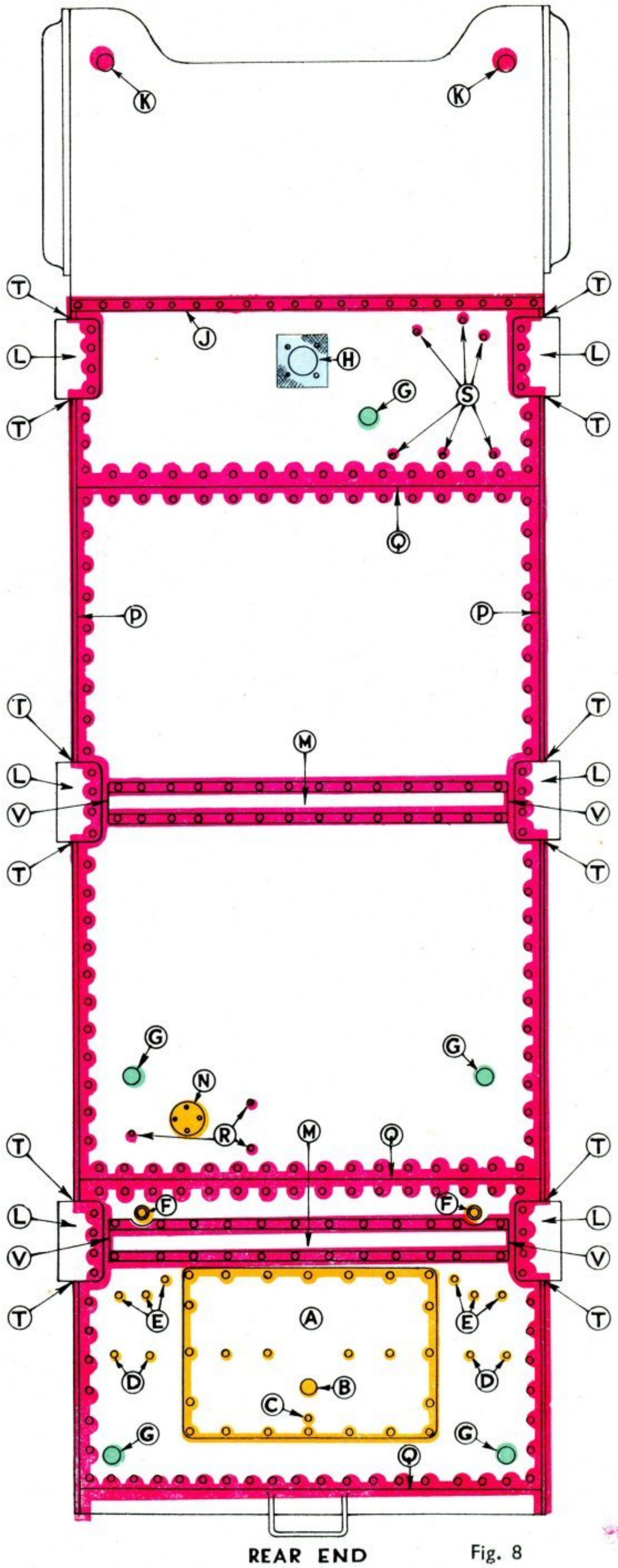

Fig. 8

See that ALL trace of the greasy protective compound, applied to the vehicle by the manufacturers, is removed as called for at Task 5.

38. **Rear cowl " C," Fig. 9.**
Paint the mating surfaces of the flanges on the rear cowl and support frame for rear cowl with a generous coat of Bostik AA. Bring the flanges together and fit the twenty-two fixing bolts and nuts and pull them up tight all round. Paint the bolt heads and nuts with Bostik AA. The angle irons which form the mating flanges on the rear cowl and the support frame, are tack-welded on to their respective parts. The gaps between welds must be filled with Bostik 692, the joints throughout being finally painted with Bostik AA.

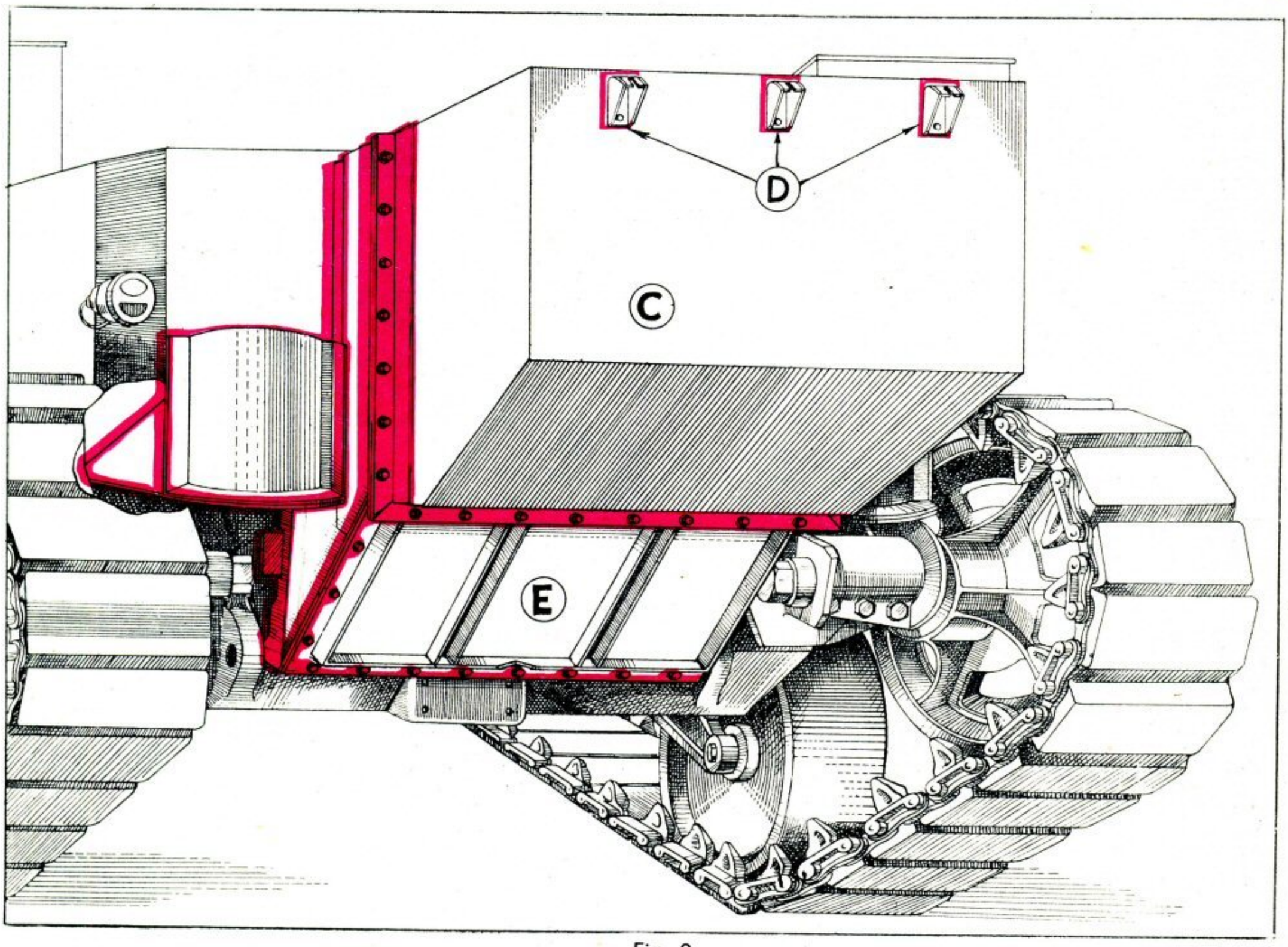

Fig. 9

39. **Fitting three lugs " D " for tee bolts.**
These parts are supplied in Kit " A." The three lugs for tee bolts are fitted to the back of the rear cowl just below the top of the flange. Paint the mating surfaces of each lug and the rear cowl with Bostik AA. Fit the three lugs to the rear cowl with the slotted ends towards the top of the cowl, inserting the bolts from the outside. Paint over the bolt heads with Bostik AA.

40. **Four sealing strips " C," Fig. 10.**
These parts are supplied in Kit " C." Using Bostik C., paint the top flanges of the rear cowl and support frame. Take the two long and the two short rubber sealing strips and paint one side of each of these with Bostik C. When tacky, stick the strips on to the flanges, so as to form a continuous seal round the top of the rear cowl. Take care in handling the strips that Bostik C. is not allowed to get on to their uppermost surfaces.

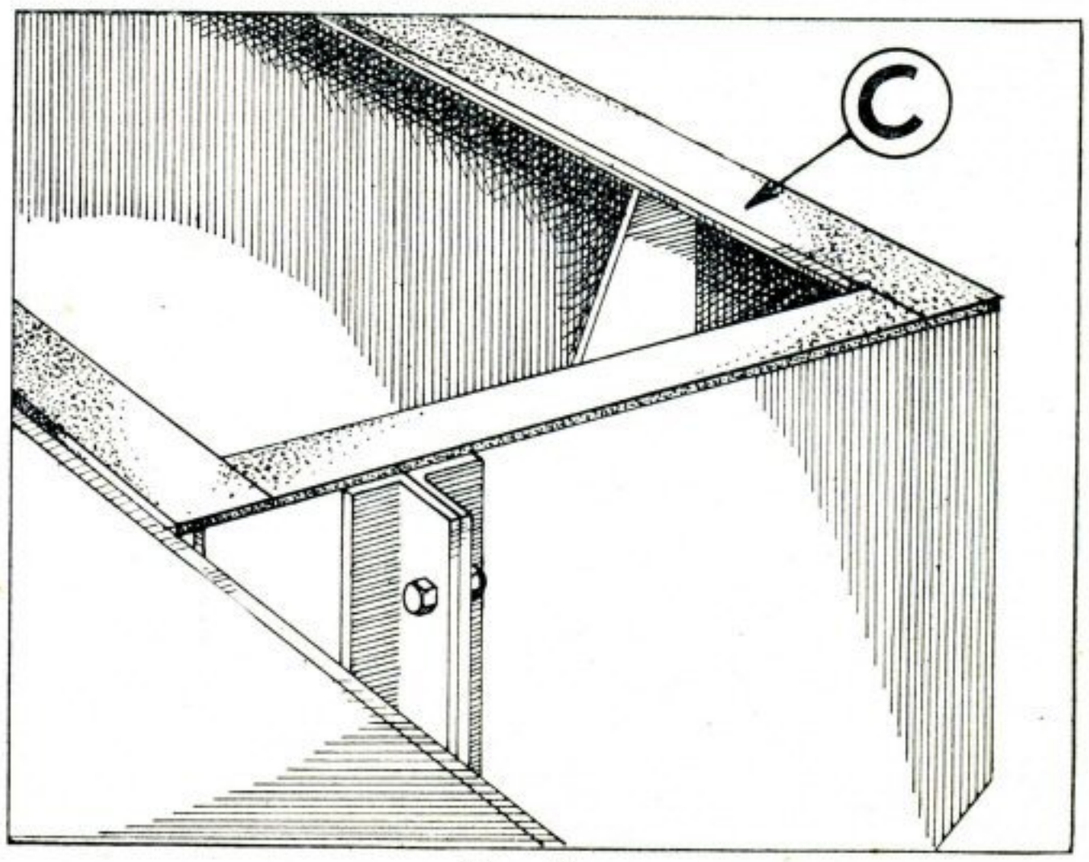

Fig. 10

TOP OF HULL (FIGHTING AND DRIVING COMPARTMENT). Figs. 14 and 16.

Three men required for Tasks 41 to 46 inclusive.

41. **Canvas apron for howitzer aperture. Figs. 11 and 14.**

A ready-made canvas apron is supplied in Kit "C" for the purpose of blanking off the howitzer aperture at front of the vehicle. One end of this apron is made to fit on the "U" shaped frame welded at the front of the howitzer sleigh. With the fabric held in position on this frame, mark back and pierce holes in the hem to correspond with those in the frame. Using the two "U" shaped strips provided in Kit "A," together with the necessary bolts and nuts, clamp the fabric to the howitzer (see illustration). The opposite wide end of the apron is offered up to the strip

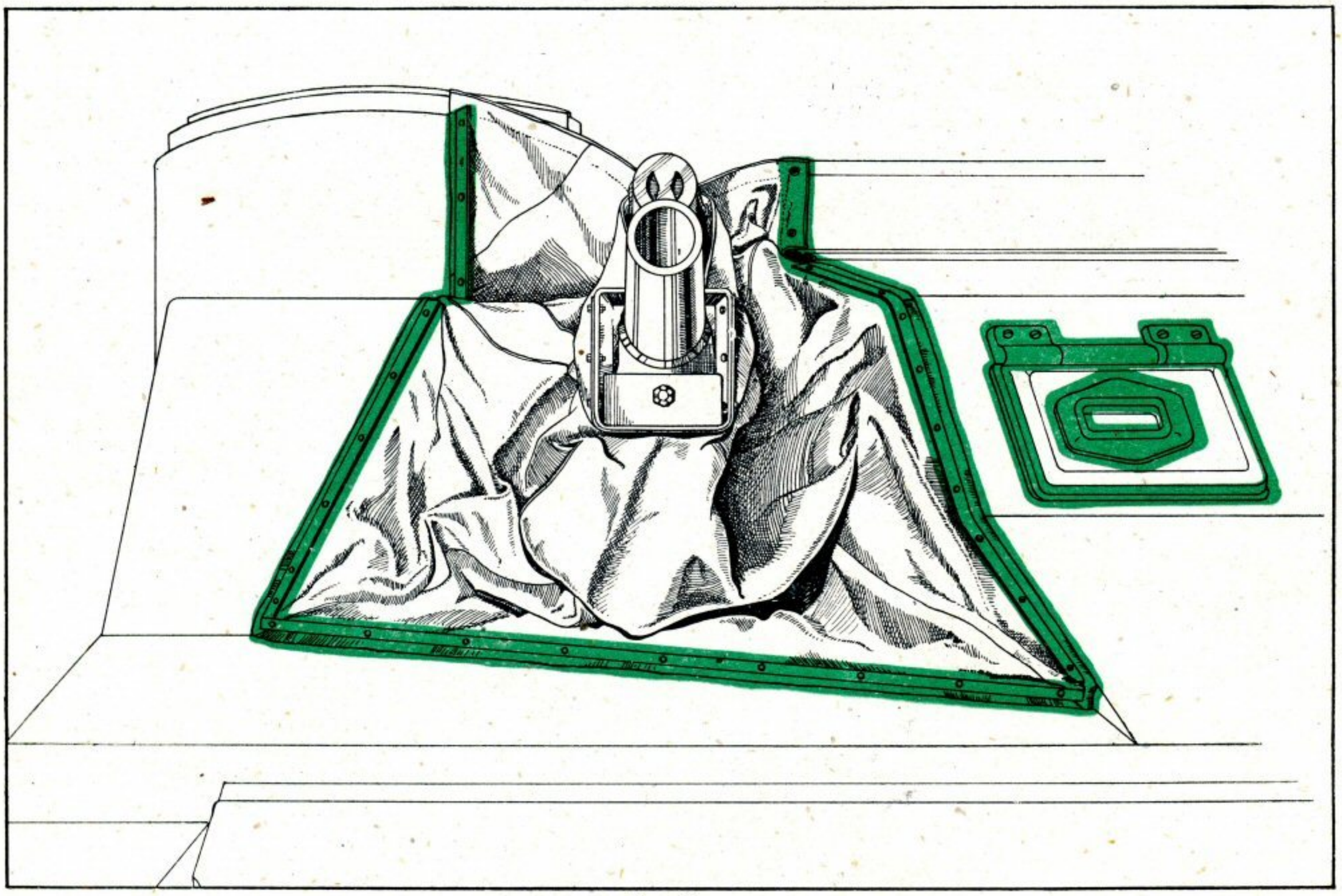

Fig. 11

framework welded to the front of the vehicle. The holes in the framework are marked back and holes pierced in the hem of the apron. The fabric is then clamped in position on the framework, using the retaining strips and nuts and bolts provided. Wherever holes are marked back and pierced in the fabric the holes must be made in the centre of hem. Take care that this apron is not damaged after fitting, take precautions against the fabric being chafed by contact with external objects.

42. **Rear splash plate "A," Fig. 14.**

First remove the air intake grille, the two bolts retaining this part are used in attaching the rear splash plate. The two bolts "E," Fig. 16, on the engine compartment top plating are also removed and used to attach this splash plate. Bolt the two corner pillars "B," Fig. 14, to the angles welded to the insides of the fighting compartment side armour, fitting the corner pillars with their broad flanges facing rearwards, and their short flanges above the side armour. ~~The rear splash plate is then fitted, using the four bolts previously removed.~~ At its outer ends the splash plate is secured to the corner pillars with bolts, large plain washers and wing nuts (Kit "A"). Insert the bolts from the inside, using two plain washers per bolt (one inside and one outside). Tighten up the wing nuts from the outside.

43. **Left-hand splash plate "C," Fig. 14.**

This plate is fitted by inserting the channel iron into the lug on the side armour. The rear end is attached to the corner pillars in a similar manner to that adopted on the rear splash plate. The clamp "D," Fig. 14 (Kit "A") is then bolted in position at the front end of the splash plate as shown in illustration. Using the $\frac{1}{2}$ in. B.S.F. bolt 3 in. long and the $\frac{1}{2}$ in. B.S.F. nut, tighten the channel iron into the lug as illustrated.

TOP OF HULL (FIGHTING AND DRIVING COMPARTMENT). Figs. 14 and 16.
Three men required for Tasks 41 to 46 inclusive.

41. **Canvas apron for howitzer aperture. Figs. 11 and 14.**

A ready-made canvas apron is supplied in Kit "C" for the purpose of blanking off the howitzer aperture at front of the vehicle. One end of this apron is made to fit on the "U" shaped frame welded at the front of the howitzer sleigh. With the fabric held in position on this frame, mark back and pierce holes in the hem to correspond with those in the frame. Using the two "U" shaped strips provided in Kit "A," together with the necessary bolts and nuts, clamp the fabric to the howitzer (see illustration). The opposite wide end of the apron is offered up to the strip

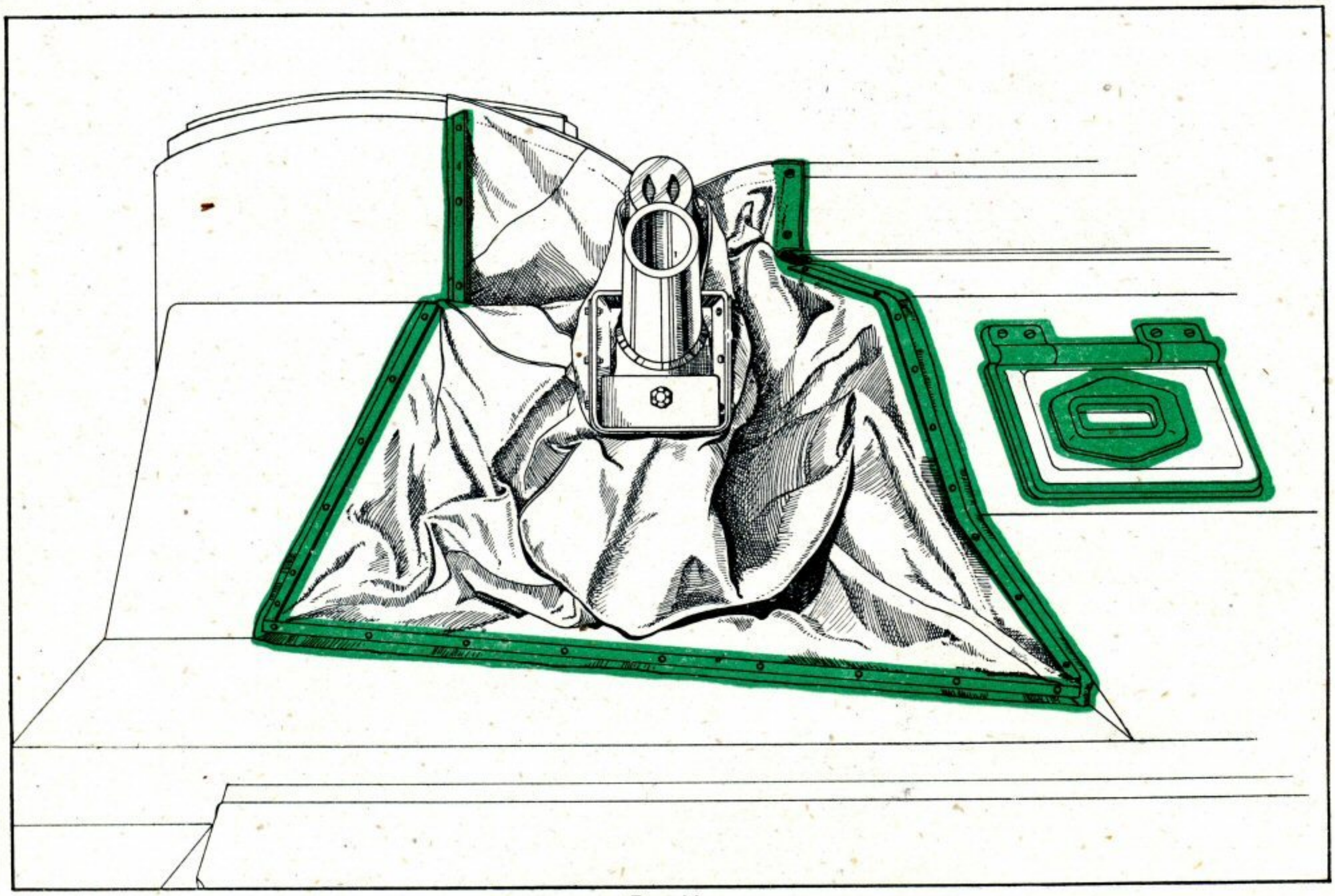

Fig. 11

framework welded to the front of the vehicle. The holes in the framework are marked back and holes pierced in the hem of the apron. The fabric is then clamped in position on the framework, using the retaining strips and nuts and bolts provided. Wherever holes are marked back and pierced in the fabric the holes must be made in the centre of hem. Take care that this apron is not damaged after fitting, take precautions against the fabric being chafed by contact with external objects.

42. **Rear splash plate "A," Fig. 14.**

First remove the air intake grille, the two bolts retaining this part are used in attaching the rear

The rear splash plate is then fitted, the air intake grille is secured back in position using the two bolts previously removed, which also bolt up the rear splash plate. Further two bolts required are those referred to in line 2 and marked "E" in Fig: 16.

43. **Left-hand splash plate "C," Fig. 14.**

This plate is fitted by inserting the channel iron into the lug on the side armour. The rear end is attached to the corner pillars in a similar manner to that adopted on the rear splash plate. The clamp "D," Fig. 14 (Kit "A") is then bolted in position at the front end of the splash plate as shown in illustration. Using the $\frac{1}{2}$ in. B.S.F. bolt 3 in. long and the $\frac{1}{2}$ in. B.S.F. nut, tighten the channel iron into the lug as illustrated.

44. **Right-hand splash plate " E," Fig. 14.**
This plate is fitted in a similar manner to the left-hand splash plate as described in Task 43.

45. **Front splash plate " F," Fig. 14.**
This plate is fitted with its flanged edge on the driver's roof plate and its flanged end inside the lug attached to the left-hand side armour plate. This front corner joint is bolted up in a similar manner to that adopted in Task 42. The two lugs on the rear of this front splash plate are held on to the driver's roof plate by means of the clamps provided in Kit " A." This method of fitting is used so that immediately on landing this plate can be discarded to allow normal forward vision.

46. The upper edges of the apron (fitted in Task 41) are finally drawn up to the top of the howitzer and front splash plate by means of the length of rope provided, this being laced through the eyelets in the apron edges and the holes in the front splash plate. The rope is to be pulled up taut and tied. The splash plates and the side armour are now sealed, using A.C. The joints between the splash plates and hull, between the splash plates and side armour are all sealed, inside and outside, with a fillet of A.C. as indicated at "G" and "H," Fig. 14, and at "H," Fig. 16. The corner joints between the splash plates and the joints between the corner pillars and the side armour are all sealed, inside and outside, with a fillet of A.C. All external heads of bolts securing the side armour are to be sealed with Bostik AA. The apron is sealed on to its support strips and the hull with a generous fillet of A.C. as shown in Figs. 11 and 14.

TOP OF HULL (REAR).

Two men required for Tasks 47 to 50 inclusive.

47. The two air outlet grilles " C," Fig. 16, over the engine compartment are blanked off with the steel plates provided in Kit " A." These are attached to the wire grilles by means of hook bolts which are first fitted to the plates. By slackening off the nuts on these hook bolts the plates can then be fitted, hooking the bolts around a convenient portion of the grille and tightening down the nuts. **Take care not to remove the nuts from the hook bolts when fitting the plates to the grilles, otherwise the bolts will drop through into the engine compartment.**

48. These blanking plates are sealed by applying A.C. at the joints around the edges of the plates and over the protruding ends of the hook bolts.

49. **Two stowage bins. Figs. 12 and 13.**
Plug the gaps between the sides of the bins and the hull plates which form their bases with Pressure Plastic. Apply this compound from the outside of the bins and build up a fillet all round their bases. Where the Pressure Plastic has exuded through the gaps to the insides of the bins, smooth it off to form an internal fillet. Paint the base

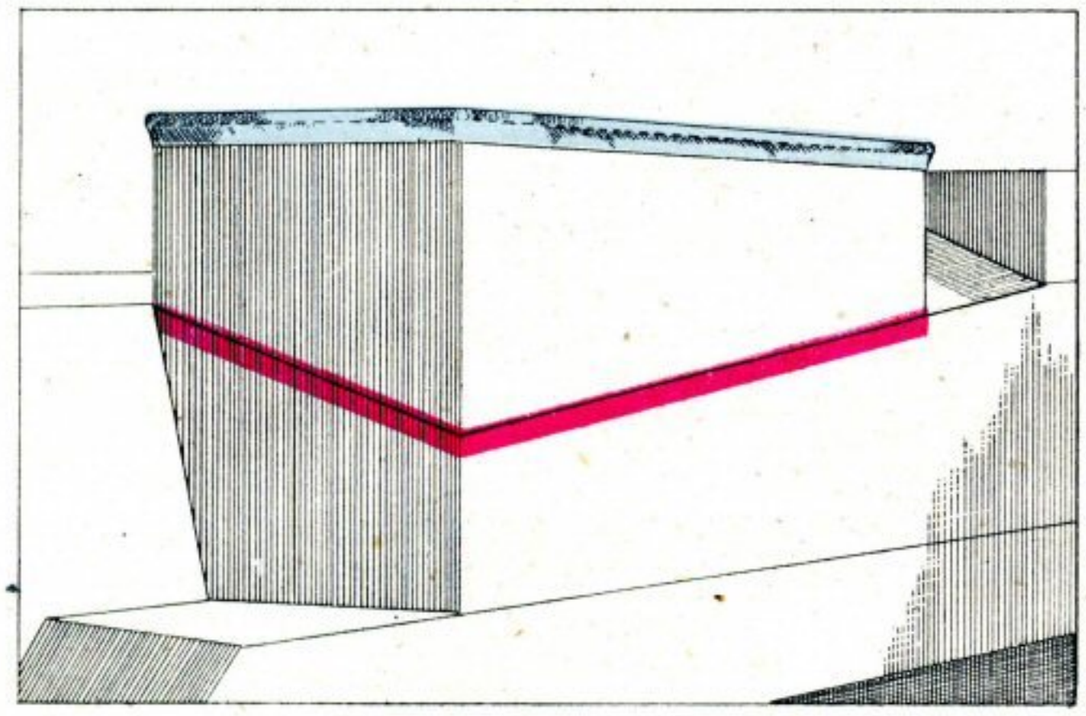

Fig. 12

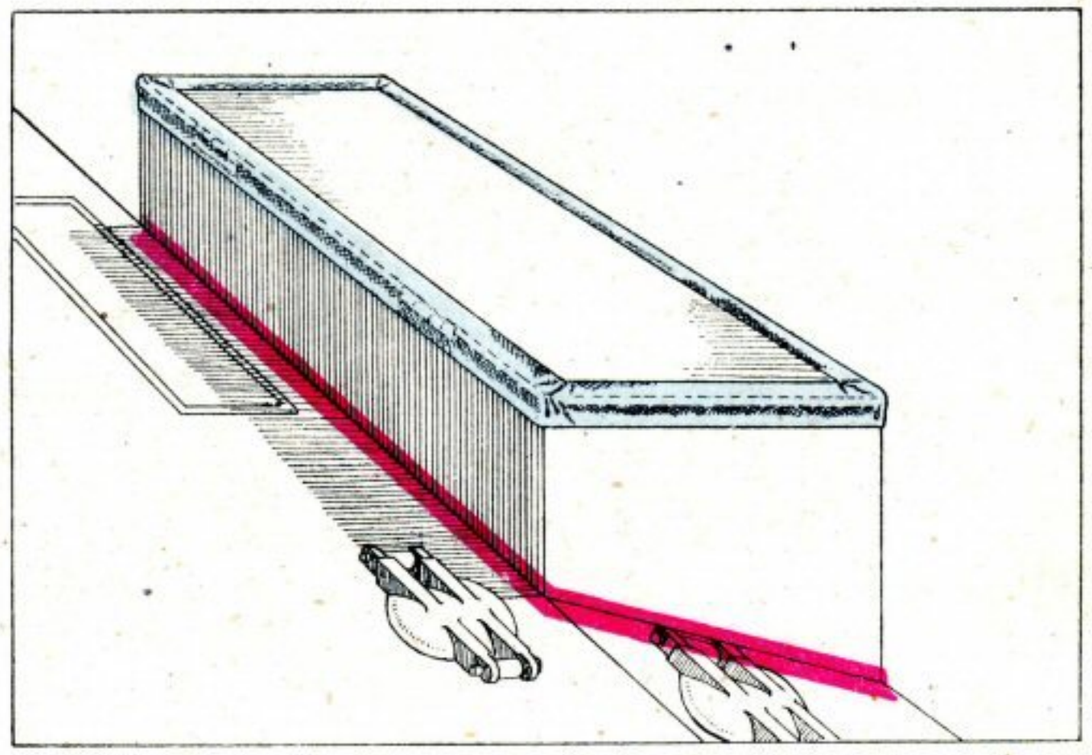

Fig. 13

joints of the two bins both internally and externally on all sides with Bostik AA. When this sealing is dry the equipment may be re-stowed ; it should be noted that this sealing may require touching up at the stage when final sealing of the locker lids is carried out.

See that ALL trace of the greasy protective compound, applied to the vehicle by the manufacturers, is removed as called for at Task 5.

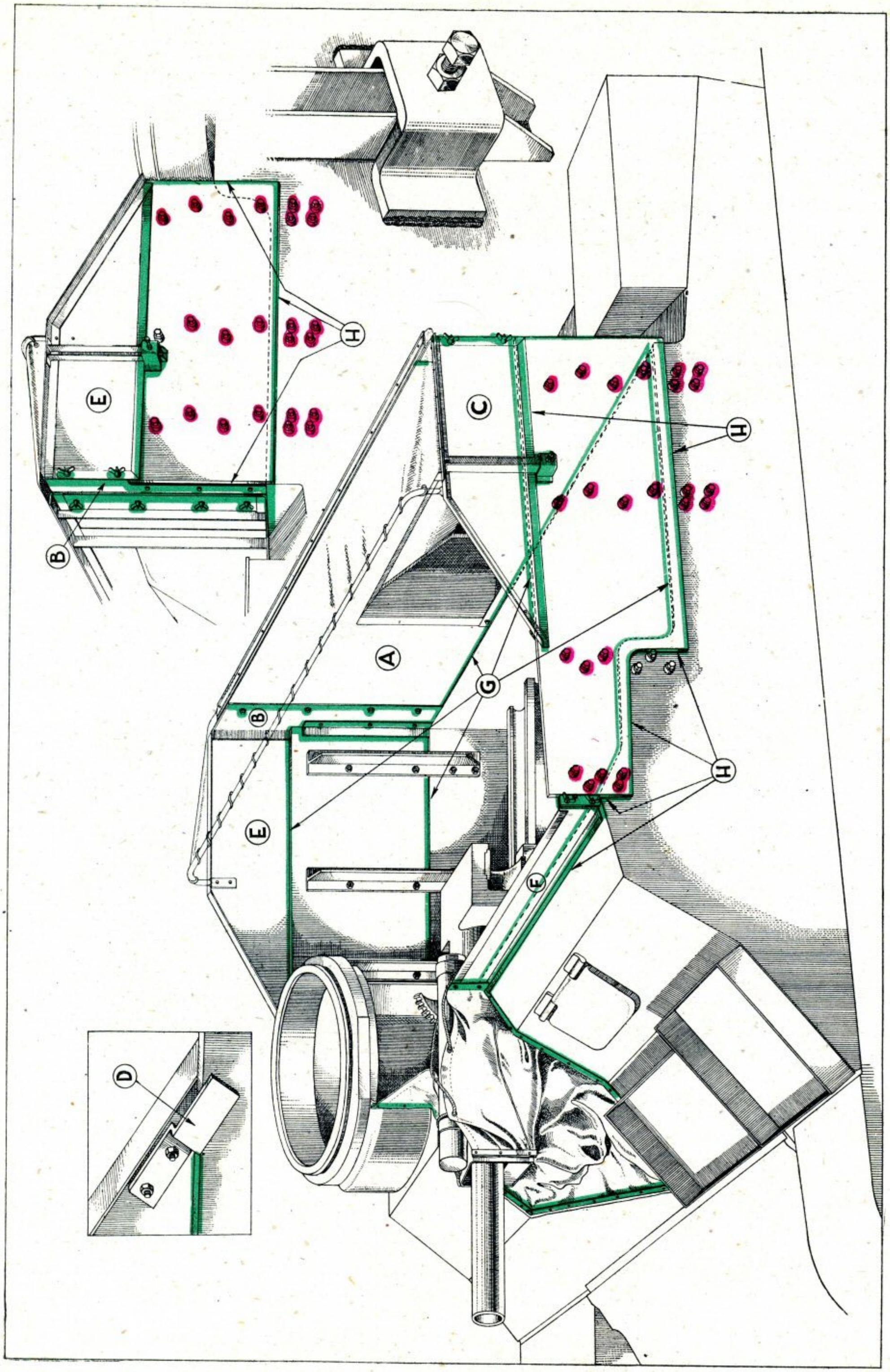

Fig. 14

50. **Two fuel cock apertures " D," Fig. 16.**
These two apertures are to be sealed with fabric patches as supplied in Kit " C." Make sure that the area surrounding the apertures is clean. Paint the patches and a corresponding area of the top plating and the fuel cock handles with Bostik C. Open both fuel cocks and when the adhesive has become tacky apply the patches, making sure that the edges are well stuck down. Finally paint over completely with Bostik AA.

51. **Driver's look-out.**
Remove the windscreen and wiper (if fitted). A.C. is applied all round the ledge on the slant plate, the protecting flap is then closed down and secured. The surplus compound thus forced out is added to, to form a complete external seal. Add further A.C. to cover the hinges. The centre portion of the flap is also sealed with the same compound up to and including the vision aperture as shown in Fig. 11.

52. The siren is sealed with A.C. in the following manner. Remove the front and rear covers and then remove the vaned rotor by taking out the screws fitted round the boss. A bead of A.C. is applied to the face of the body, behind the rotor, which is then replaced. The cable entry into the rotor casing and all joints, together with the studs in the rotor casing, are sealed. The front and rear covers are then replaced. Seal the joint between the rear cover and the body, seal all cable sheathing and joints from the siren and up to and including the tee piece fitted to the hull, just below the headlamps.

53. Each head and black-out lamp is to be completely sealed all over with A.C. (as shown in Fig. 15). All gaps and joints in the mounting bracket are also sealed with this compound, together with all cable sheathing and fittings. In the case of the left-hand headlamp, the cable sealing must join up, at the tee piece, with the sealing on the siren cable. The cable sealing on the right-hand headlamp includes the elbow fitting on the hull. Take care that a good fillet of A.C. is applied where the tee piece and elbow fit on to the hull.

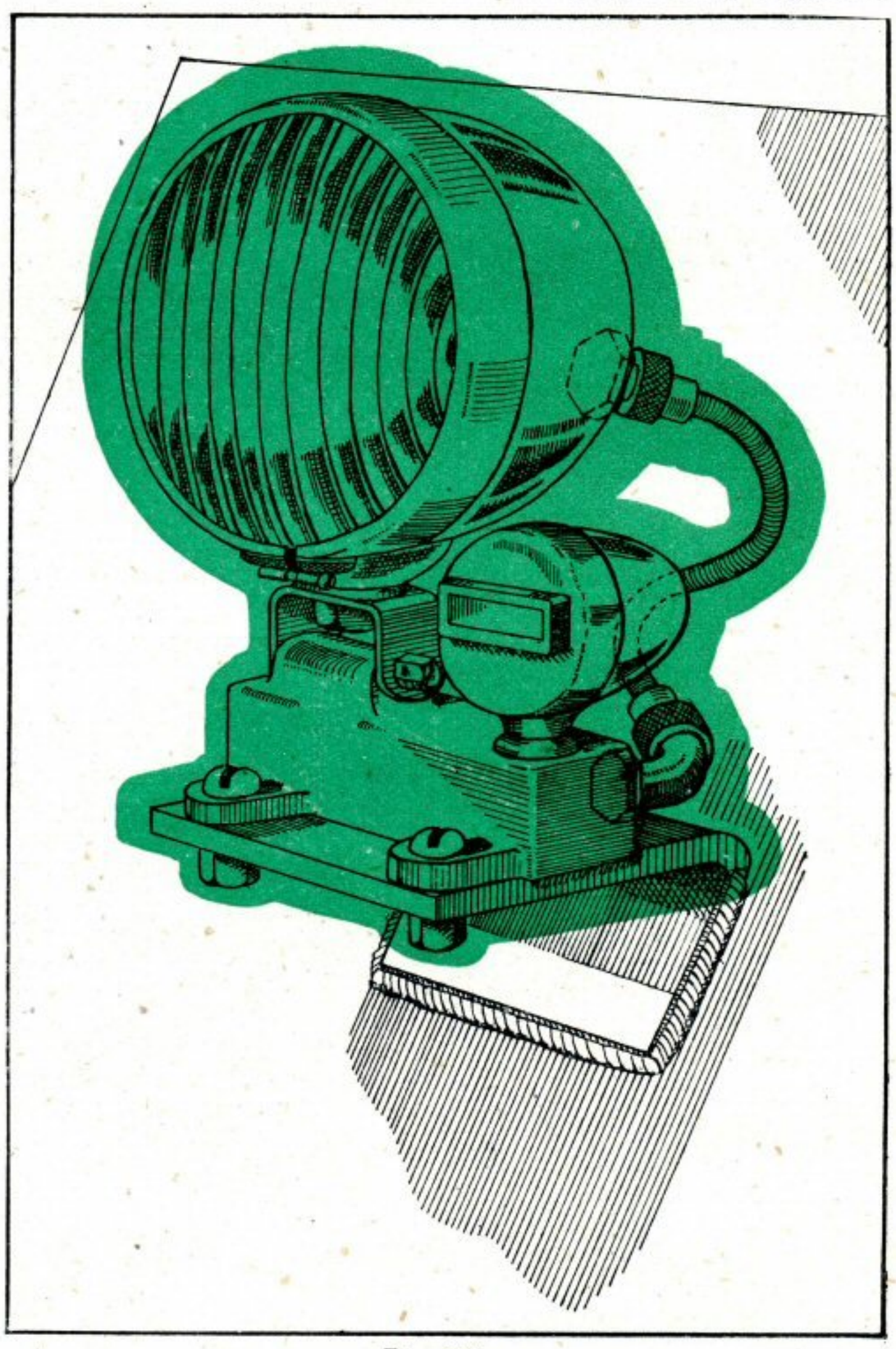

Fig. 15

54. The rear engine doors have now to be sealed. Check that the hinge fixing screws are tight. With the doors open apply a bead of A.C. round the hull plating on to which the doors shut. Close the doors and tighten up the door securing bolts. If any door screws are **missing or defective,** they **must be replaced.** Applying a further quantity of A.C., seal all around the door edges, hinges and centre closing strip, together with all bolt heads.

55. **Filler piece for bottom rail.**
This part is supplied in Kit " A." In the centre of the bottom rail, fitted beneath the engine access doors, there is a portion of metal cut away. This gap is now closed by inserting the filler piece, which is held in position by two nuts and bolts, all mating surfaces and the fixing bolts being painted with Bostik AA.

56. **Check all sealing called for at Tasks 7 to 55 inclusive. This inspection is most important since the next step is a fresh-water test of the efficiency of the sealing carried out up to this stage.**

See that ALL trace of the greasy protective compound, applied to the vehicle by the manufacturers, is removed as called for at Task 5.

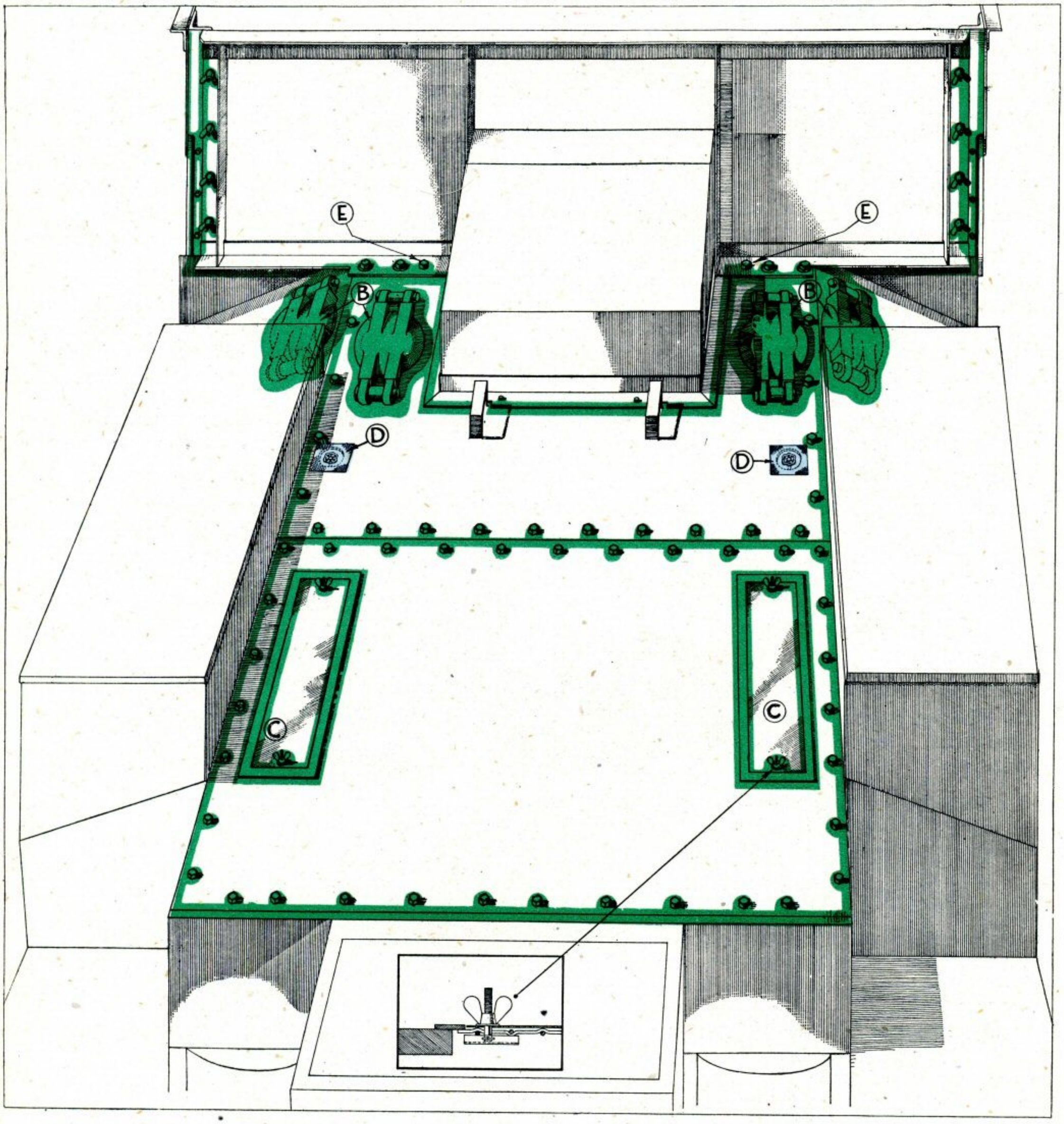

Fig. 16

57. Before the vehicle is immersed in the water the rear cover panel " E," see Fig. 9, must be fitted. The cover is fitted with the stiffening ribs on the outside, and the cut-away rib to the bottom (to clear the towing hook if fitted). The mating surfaces are coated with Bostik AA., and all retaining bolts are dipped in this compound before fitting ; note that each bolt is fitted with a plain washer adjacent to the cover panel, the spring washer being adjacent to the bolt head. Finally paint over the edges of this joint and bolt heads and washers with Bostik AA.

58. **Fresh-water test.**
After allowing sufficient time for all sealing to thoroughly set, the vehicle is to be driven into FIVE FEET OF FRESH WATER. It should be emphasised that the choice of a suitable place of immersion will require considerable care. Avoid steep approaches and mud bottoms. The site should be thoroughly investigated before a vehicle is immersed. Paint or chalk a line on the vehicle 5 feet from the ground, and then drive the vehicle into the water as slowly as possible until the water level reaches this mark. This is to avoid water getting into the aperture in the top of the rear cowl, since this opening will only be a few inches above the water level. The duration of this fresh-water test is **one hour.** Whilst the vehicle is in the water, inspect carefully for leaks ; there should not be any, but if any are found, remove the vehicle from the water immediately, dry off and rectify any defective sealing. The vehicle should then be immersed again and this procedure repeated if necessary until the vehicle will stand for the specified time without leaking.
During this test and subsequent stages, care must be taken not to disturb any of the sealing, particularly that accomplished with A.C.
After this test the driver will no doubt wish to use his look-out prior to embarkation, in which case the sealing of this item will have to be re-made prior to embarkation, or on the landing craft as conditions demand.
Similarly, under certain climatic conditions, it may be necessary to remove the rear cover panel fitted at Task 57 to prevent the engine overheating. If this action is taken the cover panel must be re-fitted prior to embarkation as called for at Task 57.

59. Fit three eye brackets to the base of the air outlet duct. These are fitted with the shank uppermost, see Fig. 17. The mating surfaces of the brackets and the duct are first coated with Bostik AA., together with the fixing bolts. Fit also to either side of the duct, towards its top, the two brackets for tie rods ; these are positioned with the hole for tie rod facing forward and downwards. The mating surfaces of the brackets and the duct are first coated with Bostik AA., together with the fixing bolts.

WIRELESS

Two men required for Tasks 60 to 68 inclusive.

60. The set must be netted, the variometer tuned and control units tested before sealing work is commenced. Switch off and disconnect from the set, aerial leads, battery lead and lead to control units.

61. **Braided metal cables** requiring protection are indicated in Fig. 17. Paint these portions thoroughly with Bostik AA. Do not paint the detachable covers or the ends of plugs, otherwise it will be impossible to remove them.

62. **No. 19 Set.** Release the set and carrier from the vehicle mounting. Lay Bag W.P. Signal No. 5 (Kit " C ") on the ground, bottom uppermost. Place the carrier on the bottom of the bag and mark off the position of the securing bolt holes. At the points marked, pierce holes in the bag. Over each of these holes on the inside of the bag and again on the outside stick leather washers, using Bostik C. If leather washers are not issued, smear round the holes, on both sides, with Bostik C.
Place the carrier and set in the bag and screw down to the mounting brackets, taking care not to tear the bag.
Holes must be pierced in the bag to admit aerial leads, battery lead and lead to control units. Gather up the bag to the top of the set and secure with the tapes provided. The points of connection can then be marked on the outside of the bag.
Untie the tapes, let down the bag and pierce the holes where marked. The holes must be made the smallest possible size to admit the leads in each case. Thread the leads through the holes and make all connections. Gather up the bag and tie as before. Fit the cap.
Where the feeders and leads enter the bag, seal off with an application of A.C.

63. **Control unit** (on right-hand side of vehicle). A piece of W.P. Fabric 20 in. × 20 in. is supplied from Kit " C " for use with the control unit. Release the unit from its mounting and place it square

in the centre of the fabric. Using the unit as a template, mark off the securing holes and pierce the fabric. Smear round the holes in the fabric on both sides with Bostik C. and bolt the unit back into place on top of the fabric. Fold the fabric neatly over the front of the unit, left to right, right to left, bottom to top, top to bottom. As each fold is layered over, tack in position with Bostik C. Where the leads protrude through the fabric cover, seal off with A.C.

64. **Microphones.** Place each microphone inside Bag W.P. Signal No. 1 and secure the mouth tightly round the cable with the tapes provided. Microphones will function with the bag fitted, but it is necessary to speak louder than normally.

65. **Headsets.** Cover the terminals on each headset with A.C.

66. **Spares, Cases and Oddments.** Place these inside Bag W.P. Signal No. 6. Gather up the mouth of the bag and tie tightly with the tapes provided. Stow away safely in the vehicle.

67. **Inspect work called for in Tasks 60 to 66 inclusive.**

68. Test the wireless set and control units for efficient functioning. The set and control unit switches can be operated beneath the fabric covers. Remember that the control unit operation is :—

Switch to **LEFT** "B" Set operates.
" " **CENTRE** I.C. "
" " **RIGHT** "A" Set "

69. **Take all your remaining sealing materials with you.**

70. The air outlet duct together with its fittings, tee bolts, nuts, tie rods, etc., are to be securely lashed to some convenient part of the vehicle for transit to the point of embarkation.

71. If the vehicle is fitted with all-metal tracks these will need protection during a protracted sea voyage. This is provided by oiling the tracks; a used petrol tin must be filled with waste engine oil and stowed on the vehicle for this purpose.

72. The driver's look-out, sealed at Task 51, may now be opened for the purpose of driving the vehicle to the point of embarkation.

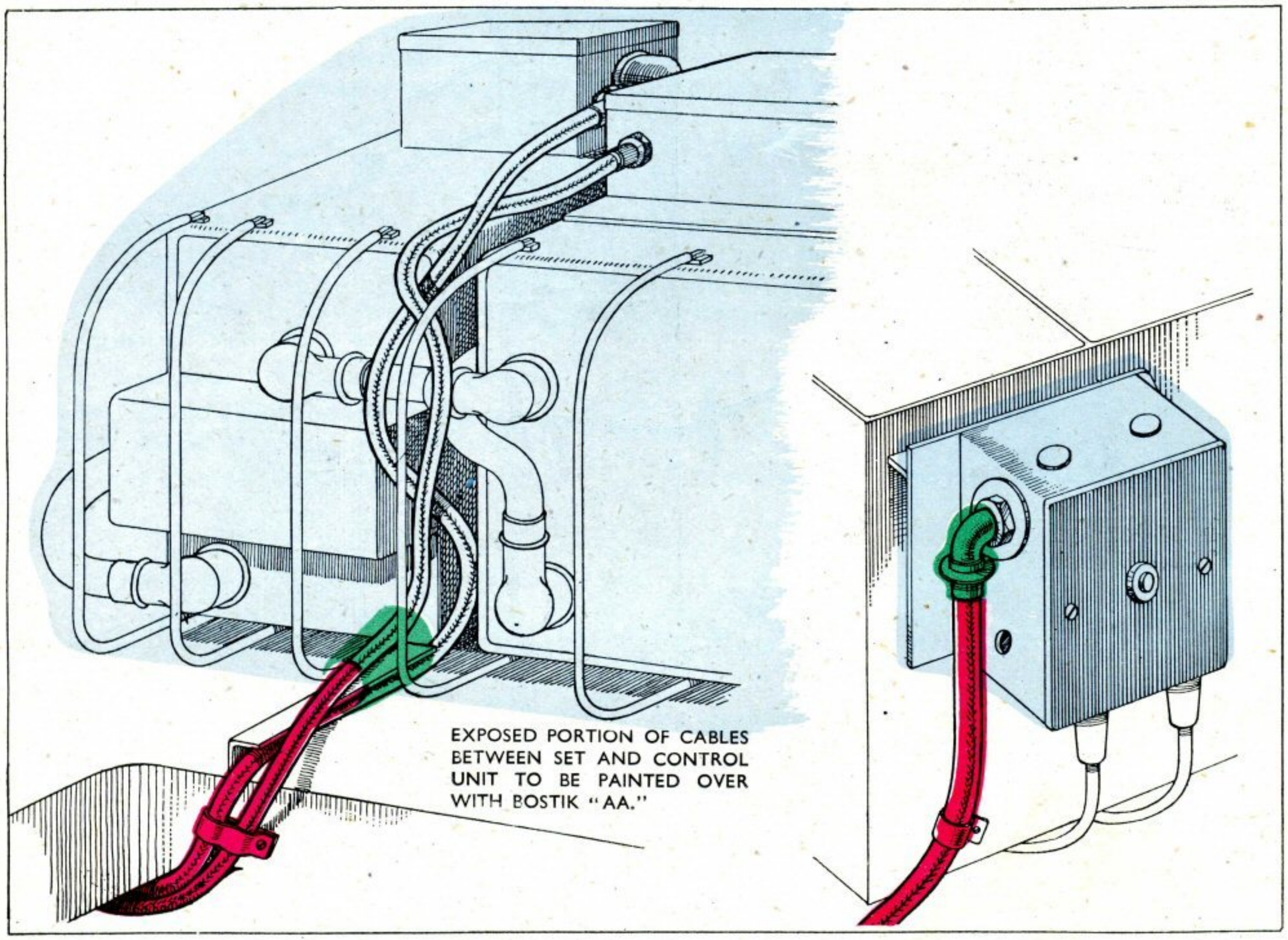

Fig. 17

WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA.

73. Check fuel and oil, replenish if necessary, using an external filter for the fuel. **Take great care not to spill any fuel or oil, as these fluids will destroy sealing.** Smear the threads of the filler caps with G.S. grease before replacing.

74. **Canvas cover at rear of fighting compartment.**
Fit the support rail provided in Kit "A" as shown in Fig. 14. The canvas cover is then fitted to the rear and side splash plates by means of the retaining strips provided. With the canvas in position mark back and pierce the necessary holes in the hem, fitting the rear edge to the rear splash plate first. The front edge is laced zig-zag fashion to the support rail, using the length of rope provided in Kit "C."

75. **Four filler covers "B," Fig. 16.** Tuck the flexible breather pipes into the filler cover apertures and see that the covers are properly closed and cottered. Build up a plaster of A.C. to completely cover and seal each cover to the top of the hull. The cotter-retaining chains should be draped over the covers before the sealing compound is applied, so that they become completely buried.

76. All joints in the rear top plating and all bolt and rivet heads are now to be sealed with A.C., see Fig. 16.

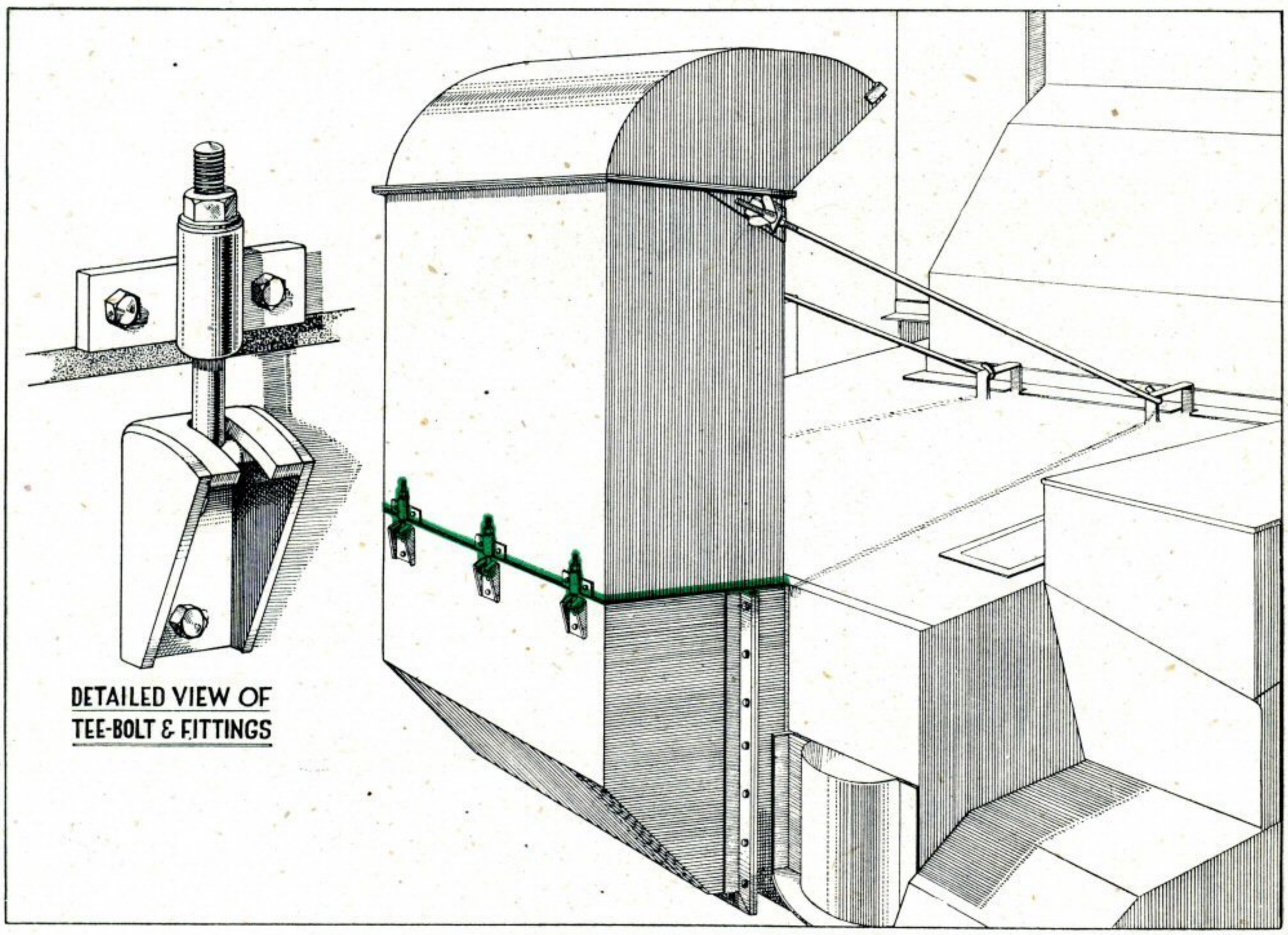

Fig. 18

77. The sealing of the driver's look-out must be re-made.

78. Erect the duct on top of the rear cowl, setting it squarely on the sealing strips already fitted at Task 40. Insert the tee bolts through the eye brackets with their heads engaging the slotted brackets on the rear cowl. Fit plain washers and $\frac{1}{2}$ in. B.S.F. nuts to the threaded ends of the tee bolts and tighten, finger-tight.

Then fit two tie rods to the brackets at the top of the duct, with plain nuts below the brackets and wing nuts above the brackets, engaging the hooked ends in the loop brackets on the top plating, see illustration Fig. 18. Then tighten the tee bolts and tie rods evenly until the duct is rigidly fixed in position.

The nuts on the tie rods underneath the brackets on the top of the duct are now tightened up to prevent the wing nuts working loose. The joint between the rear cowl and the duct base, together with the tee bolts and lugs, are sealed with A.C.

79. The driver's instruments are to be smeared round with G.S. grease to protect the metal rims and to exclude moisture from entering between glass and rim and rim and panel.

Any tools or equipment (track tools, shovels, etc.) stowed externally must be protected by an application of G.S. grease.

80. The stowage bin lids are now sealed down, using fabric strips, supplied in Kit "C," using Bostik C. as an adhesive. It should be noted that under actual operational conditions it may be desirable (at Battery Commander's instructions) to carry out this work on the landing craft, since some items may be required during the voyage.

81. Check that the sealing of the wireless equipment carried out at Tasks 60 to 66 inclusive is undamaged. Remedy any defects or damage. Finally test the set and control units as called for at Task 68.

ACTION TAKEN ON LANDING CRAFT

82. **On completion of all work specified in Tasks 7 to 81 inclusive, carefully inspect,** paying particular attention to the hull bottom plates. Any damaged fabric should be repaired or the seal remade. The amount of A.C. allotted for the sealing of the vehicle gives a surplus for use at this stage. This surplus together with cotton waste makes a "First-Aid" kit suitable for plugging and sealing any leaks which may develop (or are caused by enemy action).

83. Sheet the vehicle over, if possible, during transit to minimise the ill effects of salt water and spray.

84. All-metal tracks are to be smeared with the waste engine oil brought for this purpose. This must be done daily if the voyage is a protracted one. In the case of vehicles having tracks with rubber soles, G.S. grease must be applied to the tee bolts and connecting links.

85. **Hints to vehicle crew.**

Use **second gear** and do not change gear whilst wading.

Ease the vehicle down the ramp. On the vehicle entering the water, Commanders MUST remember that the driver, temporarily, will not be able to see.

When in the water keep engine revs. up, this will assist in preventing the engine from stalling during wading.

When leaving craft **elevate the howitzer muzzle to its maximum,** at the same time easing off, but not slackening off, the rope threaded through the eyelets in the top edge of the apron.

The driver must beware of a tendency to skid on the ramp; to avoid this, approach the point of balance slowly and square on. Once over the point of balance, do not attempt to brake or steer.

IMPORTANT

After leaving the craft the vehicle must NOT be allowed to sit in water of such a depth that waves break over the top of the splash plates, thus causing the water to enter the hull.

A stationary vehicle in deep water is likely to be swamped because it assumes the function of a breakwater against waves. A vehicle moving shorewards, in deep water, with following waves, however, is in an increasingly safer position.

The responsibility of judging local conditions and issuing orders accordingly rests with the Battery Commander.

ACTION TAKEN IMMEDIATELY AFTER LANDING

86. If any water has entered the vehicle, open the dump valves and drain off.

87. As soon as possible the air outlet duct and rear cover panel should be removed, together with the rear, side and front splash plates. Remove 2 bolts ~

88. Remove the Pressure Plastic from the ends of the transverse channels "V," Fig. 8, on the hull bottom plate.

89. W.P. Fabric bags and covers are to be removed from the wireless equipment. These may be cut away from the set and control unit. Remove Pressure Plastic and A.C.

MAINTENANCE AFTER LANDING

90. Drain off oil from final drives and replenish with fresh oil. The vehicle must not run for more than 150 miles after landing, before this work is done.

91. Clean off sealing materials from hull bottom (dump valves, drain plugs, etc.). Remove all surplus A.C.

92. Lubricate the vehicle all round **again**, as previously instructed in MAINTENANCE BEFORE SEALING at Task 3. This is important and must be done thoroughly, giving special attention to the suspension.

93. Replace fuel tank breather pipes in their normal external position.

ACTION TAKEN IMMEDIATELY AFTER LANDING

86. If any water has entered the vehicle, open the dump valves and drain off.

87 (ctd) The two bolts securing the air intake grille must be removed before the rear splash plates are jettisoned. The bolts should be retained so that the air intake grille may ~~be~~ then be repositioned.

89. W.P. Fabric bags and covers are to be removed from the wireless equipment. These may be cut away from the set and control unit. Remove Pressure Plastic and A.C.

MAINTENANCE AFTER LANDING

90. Drain off oil from final drives and replenish with fresh oil. The vehicle must not run for more than 150 miles after landing, before this work is done.

91. Clean off sealing materials from hull bottom (dump valves, drain plugs, etc.). Remove all surplus A.C.

92. Lubricate the vehicle all round **again**, as previously instructed in MAINTENANCE BEFORE SEALING at Task 3. This is important and must be done thoroughly, giving special attention to the suspension.

93. Replace fuel tank breather pipes in their normal external position.

COMPLETE SUMMARY OF TASKS

MAINTENANCE BEFORE SEALING.

1. Check contents of stowage bins. Check that lids close properly.
2. Internal and external inspection of vehicle for missing bolts, nuts, screws. Replace.
3. Lubricate vehicle throughout. Protection with G.S. grease.
4. Clean filters, fill the oil and fuel tanks.
5. Cleaning down externally. Remove and clean all bolted-on inspection covers on the hull bottom plate. Discard gaskets. Remove towing hook.

WORK TO BE CARRIED OUT IN THE FIELD OR IN CONCENTRATION AREA.

6. Remove detachable front, rear and side portions of track guards. Break tracks, partially withdraw drive sprockets. Remove two covers under fuel tank drains.
7. Seal joint transmission casting/slant plate.
8. Seal joints transmission casting/hull side plates.
9. Seal joints transmission casting/final drive covers.
10. Seal four plugs in transmission casting.
11. Seal three-piece transmission casting (where applicable).
12. Inspection of Tasks 7 to 11 inclusive.
13. Seal vertical portion of six bogie brackets.
14. Seal side portions of two idler brackets.
15. Seal side support angles.
16. Seal rivet and bolt heads, etc., on hull side plates.
17. Re-fit two fuel tank drain covers. Re-fit and adjust tracks.
18. Seal two tail and stop lamps.
19. Seal joints in special metal sections at rear of vehicle, seal all welded seams on the outside of vehicle.
20. Seal rear portions of idler brackets.
21. Replace any missing bolts or screws on hull bottom.
22. Seal engine access cover (hull bottom).
23. Seal four bolt heads and six rivet heads adjacent to engine access cover.
24. Seal two fuel tank drain plugs (hull bottom).
25. Seal oil drain cover (hull bottom).
26. Seal with Bostik AA. parts treated with Boscoprene.
27. Seal three screw heads forward of plate joint in front of rear transverse channel (hull bottom).
28. Seal six screw heads, hull bottom plate at rear of transmission casting.
29. Seal five dump valves.
30. Seal gearbox drain plug (hull bottom).
31. Seal joint transmission casting/hull bottom plate.
32. Seal horizontal portions of six bogie brackets.
33. Seal two transverse channels (hull bottom).
34. Seal joints hull side plates/hull bottom plates.
35. Seal three transverse joints.
36. Seal miscellaneous bolt, screw and rivet heads (hull bottom).
37. Inspection of Tasks 22 to 36 inclusive.
38. Fit and seal rear cowl.
39. Fit three lugs for tee bolts (rear cowl).
40. Fit four sealing strips (rear cowl).
41. Fit canvas apron for howitzer aperture.
42. Fit rear splash plate.
43. Fit left-hand splash plate.
44. Fit right-hand splash plate.
45. Fit front splash plate.
46. Lace up canvas apron. Seal splash plates and canvas apron.
47. Blank off two air outlet grilles.
48. Seal outlet blanking plates.

Continued

Continuation

49. Seal two stowage bins (not lids).
50. Seal
51. Sea
52. Seal siren.
53. Seal head and black-out lamps.
54. Seal rear engine doors.
55. Fit and seal filler piece for bottom rail.
56. Inspection of sealing, Tasks 7 to 57 inclusive.
57. Fit rear cover panel.
58. Fresh-water test.
59. Fit three eye brackets and two angle brackets for tie rods to outlet duct.
60. Net set, tune variometer, test control units. Disconnect leads.
61. Seal portions of cables.
62. Seal set.
63. Seal control units.
64. Seal microphones.
65. Seal headset terminals.
66. Seal spares, cases and oddments.
67. Inspection of Tasks 60 to 66 inclusive.
68. Test set and control units.
69. Stow all remaining sealing materials on vehicle.
70. Stow outlet duct and fittings on vehicle.
71. Stow tin of waste engine oil on vehicle.
72. Open driver's look-out.

WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA.

73. Check fuel and oil.
74. Erect canvas cover at rear of fighting compartment.
75. Seal four filler covers.
76. Seal the joints, bolt and rivet heads in rear top plating.
77. Re-seal driver's look-out.
78. Erect outlet duct and fit and adjust tie rods. Seal duct.
79. Protect driver's instruments and external equipment, tools, etc., with G.S. grease.
80. Seal stowage bin lids.
81. Check wireless sealing. Test wireless.

ACTION TAKEN ON LANDING CRAFT

82. Inspection of Tasks 7 to 81 inclusive.
83. Sheet vehicle over.
84. Smear all-metal tracks with oil.
85. Hints to vehicle crew.

ACTION TAKEN IMMEDIATELY AFTER LANDING

86. Drain off water, if any—open dump valve.
87. Remove outlet duct rear cover panel, rear, side and front splash plates.
88. Remove sealing from ends of transverse channels.
89. Remove wireless sealing.

MAINTENANCE AFTER LANDING

90. Drain off and replenish final drives.
91. Clean off sealing materials, hull bottom.
92. Lubricate vehicle all round.
93. Replace fuel tank breather pipes in normal positions.

49. Seal two stowage bins (not lids).
50. Seal two fuel cock apertures.
51. Seal driver's look-out.
52. Seal siren.
53. Seal head and black-out lamps.
54. Seal rear engine doors.
55. Fit and seal filler piece for bottom rail.
56. Inspection of sealing, Tasks 7 to 57 inclusive.
57. Fit rear cover panel.
58. Fresh-water test.
59. Fit three eye brackets and two angle brackets for tie rods to outlet duct.
60. Net set, tune variometer, test control units. Disconnect leads.
61. Seal portions of cables.
62. Seal set.
63. Seal control units.
64. Seal microphones.
65. Seal headset terminals.
66. Seal spares, cases and oddments.
67. Inspection of Tasks 60 to 66 inclusive.
68. Test set and control units.
69. Stow all remaining sealing materials on vehicle.
70. Stow outlet duct and fittings on vehicle.
71. Stow tin of waste engine oil on vehicle.
72. Open driver's look-out.

WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA.

73. Check fuel and oil.
74. Erect canvas cover at rear of fighting compartment.
75. Seal four filler covers.
76. Seal the joints, bolt and rivet heads in rear top plating.

77A. APPLY SELF SEALING MATERIAL TO DUCT.
(SEE PAGES 10A AND 10B)

:t tie

79. Protect driver's instruments and external equipment, tools, etc., with G.S. grease.
80. Seal stowage bin lids.
81. Check wireless sealing. Test wireless.

ACTION TAKEN ON LANDING CRAFT

82. Inspection of Tasks 7 to 81 inclusive.
83. Sheet vehicle over.
84. Smear all-metal tracks with oil.
85. Hints to vehicle crew.

ACTION TAKEN IMMEDIATELY AFTER LANDING

86. Drain off water, if any—open dump valve.
87. Remove outlet duct rear cover panel, rear, side and front splash plates.
88. Remove sealing from ends of transverse channels.
89. Remove wireless sealing.

MAINTENANCE AFTER LANDING

90. Drain off and replenish final drives.
91. Clean off sealing materials, hull bottom.
92. Lubricate vehicle all round.
93. Replace fuel tank breather pipes in normal positions.

RESTRICTED.

LONG IMMERSION INSTRUCTIONS

FOR

105-MM HOWITZER MOTOR CARRIAGE M7.

CHILWELL CATALOGUE No.72/474.

AMENDMENT No. 1 - April 1944.

Page 18. Task 42. Lines 5 and 6. For "The rear splash plate is then fitted, using the four bolts previously removed." substitute -
The rear splash plate is then fitted, the air intake grille is secured back in position using the two bolts previously removed, which also bolt up the rear splash plate. Further two bolts required are those referred to in line 2 and marked "E" in Fig: 16.

Page 27. Task 87. After line 2 add -
The two bolts securing the air intake grille must be removed before the rear splash plates are jettisoned. The bolts should be retained so that the air intake grille may then be repositioned.

PD/Ptg/308/6450.

LONG IMMERSION INSTRUCTIONS

FOR

105 MM. HOWITZER MOTOR CARRIAGE M.7
(WITH ADDITIONAL ARMOUR)

C H I L W E L L C A T A L O G U E No. 72/474

AMENDMENT No.2. - AUGUST 1944

Page 2. Line 5. For "WORK CARRIED OUT IN THE FIELD"
Substitute "WORK TO BE CARRIED OUT IN THE FIELD OR IN CONCENTRATION AREA".

Line 17. For "WORK CARRIED OUT PRIOR TO EMBARKATION"
Substitute "WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA"

Pages 6,7 and 8. Delete existing details and substitute new pages 6, 7 and 8 attached.

Page 10. At top of page. For "WORK CARRIED OUT IN THE FIELD"
Substitute "WORK TO BE CARRIED OUT IN THE FIELD OR IN CONCENTRATION AREA".

Insert pages 10A and 10B attached.

Page 25. Delete "WORK CARRIED OUT PRIOR TO EMBARKATION" and
Substitute: "WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA" at top of page.

Page 28. After task 5. For "WORK CARRIED OUT IN THE FIELD"
Substitute "WORK TO BE CARRIED OUT IN THE FIELD OR IN CONCENTRATION AREA".

Page 29. After task 72. For "WORK CARRIED OUT PRIOR TO EMBARKATION"
Substitute "WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA".

Insert new task -
77A. Apply self sealing material to duct.
(See pages 10A and 10B).

IFV/PD.Ptg.514/151/6450.

R E S T R I C T E D

LONG IMMERSION INSTRUCTIONS
FOR
105-MM. HOWITZER MOTOR CARRIAGE M.7
(WITH ADDITIONAL ARMOUR)

CHILWELL CATALOGUE NO. 72/474

AMENDMENT NO.3 SEPT. 1944.

Page 6 KIT 'A' Item 5, col. 2.

For 'Shakeproof washers (3/8") (M.T.5/9724)'

Substitute 'Washers, spring, 3/8-in.'

Page 8 KIT 'C'

Delete "LV6/MT15/NIV205 Insulating tape 1/2" (MT1/2249) 2 oz. rolls .....4"

Against 'LV6/MT15/NIV611' col. 2 for 'sides'

Substitute 'ends'

KIT 'D'

Against 'LV6/MT15/NIV438' in col. 2.

insert "(Ex KIT 'C')"

IFV/PD.Ptg.547/199/6450.